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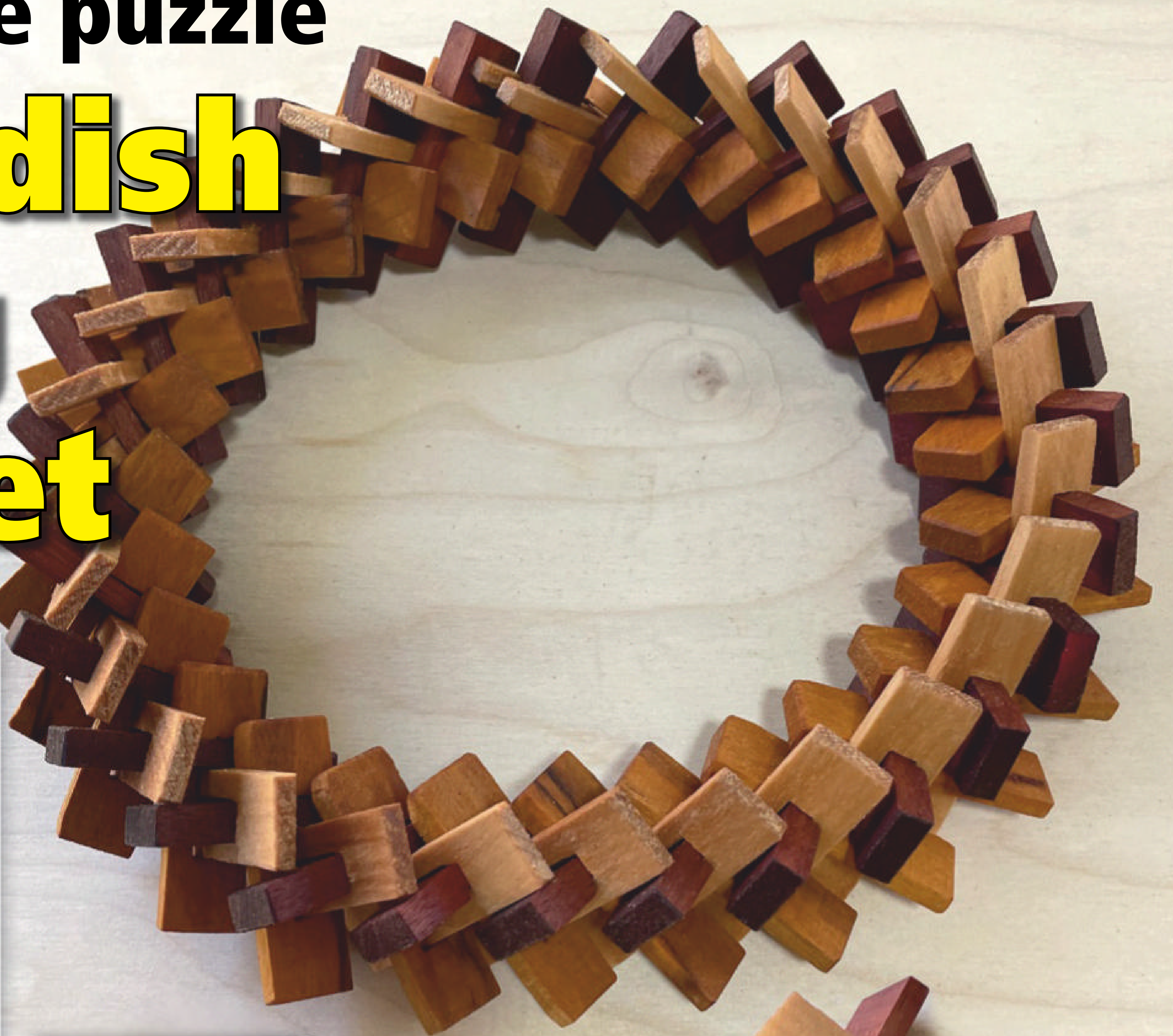

Stable router table p52

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contents

No. 175 April 2023

Departments

from our readers

Tips & Techniques 6

what's new

Boys' Toys, Books and Gear 12
FISCH wave cutters, Narex carving blades, Shinwa sliding bevel, DeWalt saw & *Swiss Army Knife Whittling Book.*

all about

Vibration in the Workshop 16
Clever Little Helpers 18

woodwork techniques

Tips for Using a Bevel Gauge 22
Planing Rough Stock 24

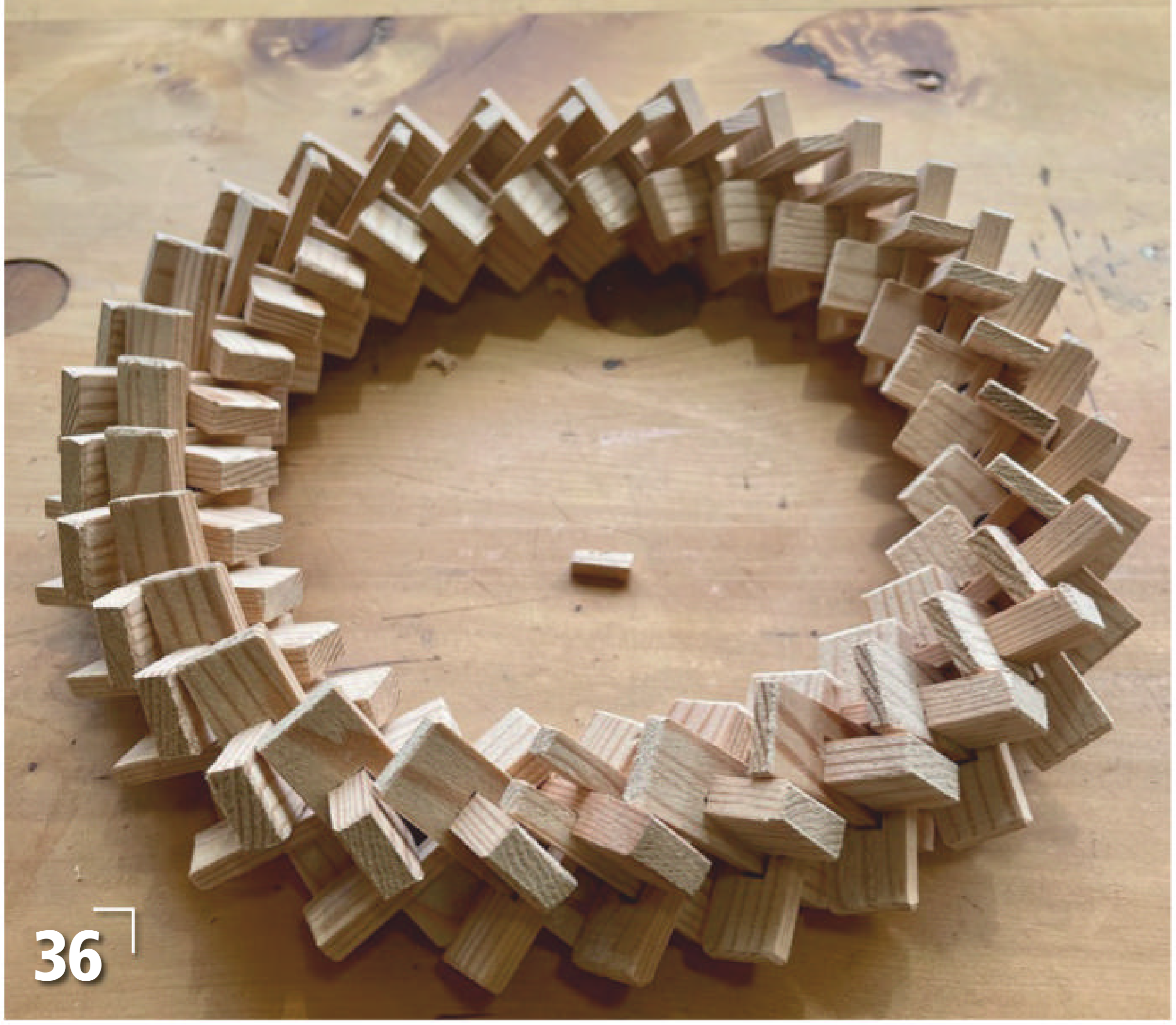
details of craftsmanship

Festool DOMINO Hacks 66

Workshop Shortcuts

Alternate Bahut Handle 72

Subscribe & Win 69
Sources 73
Final Details 74



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DrillBlock™
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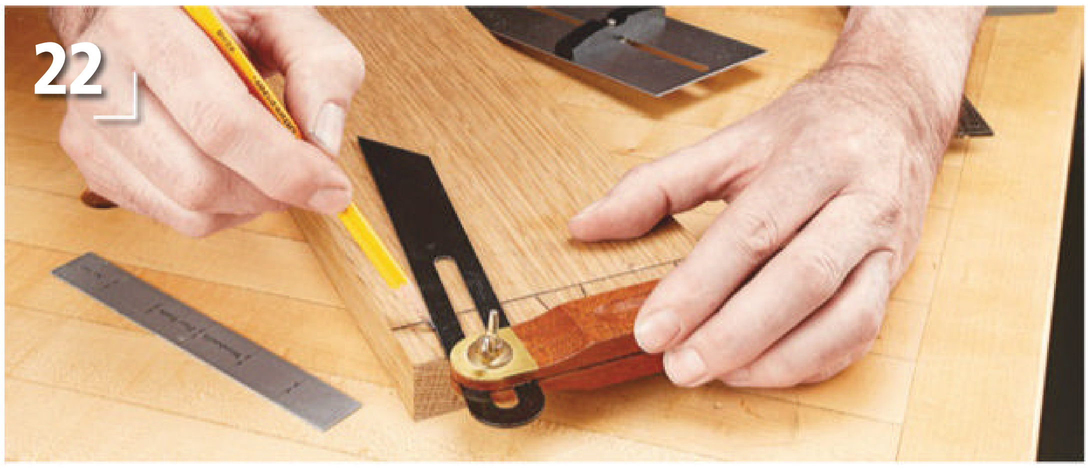

Projects

weekend project

Hand Plane Restoration 30

Resurrecting old tools just needs patience.

designer series project

Swedish Ring Trivet 36

The ultimate puzzle solved after 35 years!

heirloom project

Bahut Cabinet 44

A design classic inspired by Mr Nakashima.

workshop project

Router Table 52

Who says a workshop can't have style!

woodturning

Turning Reverse Mounts 60

Clever mounts on a budget.

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from the editor
Sawdust

Solving the Swedish yeast ring puzzle after 35 years of pondering happened when I was sitting in a brewery on the West Coast of Canada. On page 36 you can read all about the eureka moment that had me seeing for the first time how a clever Swedish trivet that had graced the dining room table for decades was made. The key to building the yeast ring was a Festool DOMINO machine. Festool has the patents for this clever machine wrapped up until 2027. After that date you can expect clones and the price of this awesome portable mortising machine to fall. We have been weaving woodwork together with dominos for more than 15 years. Over that time, we have pushed the edge of the envelope and got the tool to do things it was not designed to do. As part of this journey we noticed the horizontal datum mark that not even the manual recognised. On page 66 you can read all about how we have "hacked" our DOMINO machines.

The star project in this edition is the Bahut cabinet inspired by Mr Nakashima. You can commission a clever craftsman to build you one from book-matched walnut and have no change from $10,000. When George Nakashima built his version of this classic cabinet, he opened the eyes of craftsmen and women in the US and Europe, letting them see what can be done when a craftsman honours the tree that supplied the wood, celebrating the grain, exposing joints and even using dovetail butterflies to lock cracks and make them a central feature and not a fault.

Happy Woodworking!

Chris

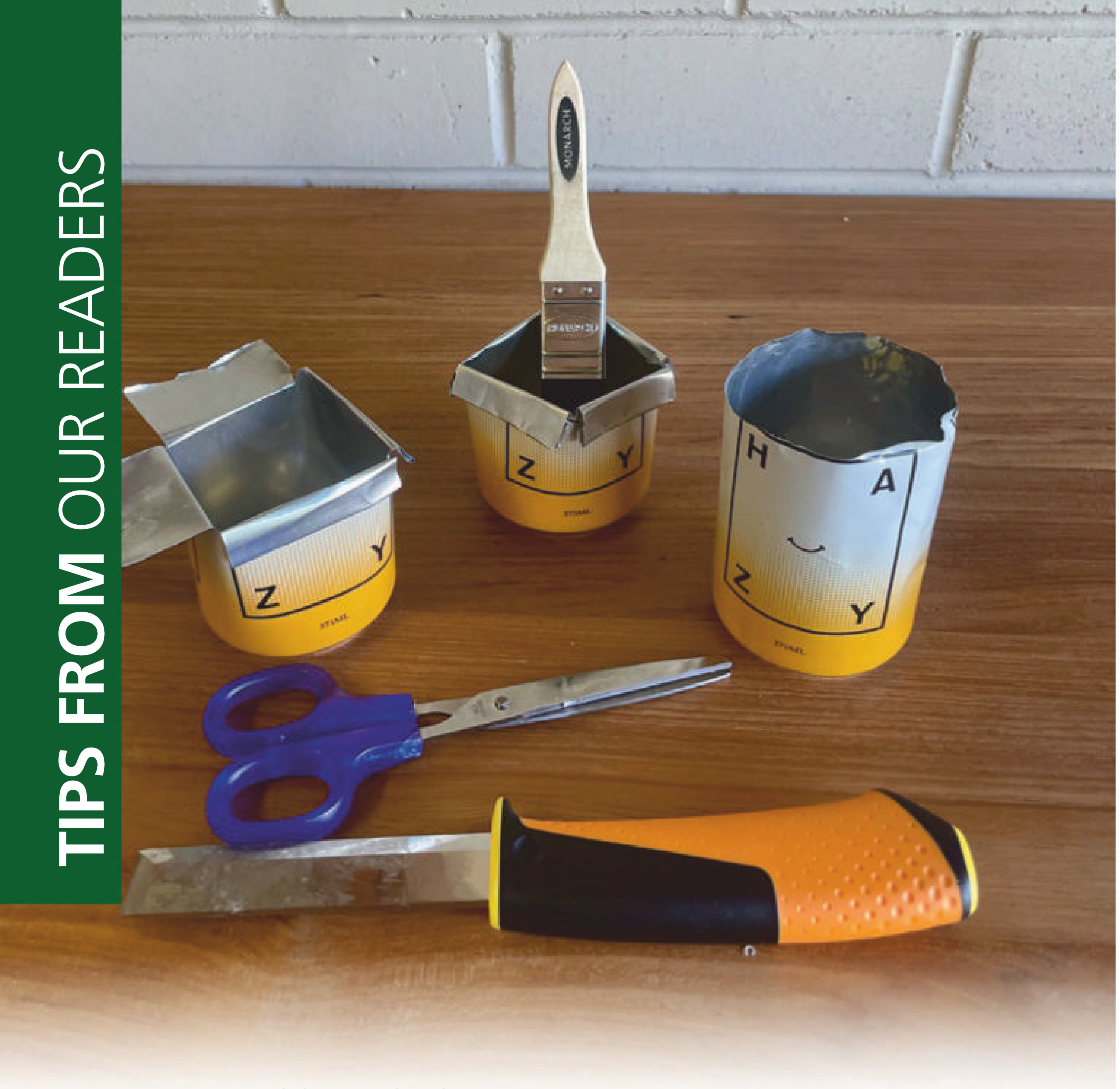
Chris Clark, Editor

Australian Woodsmith *acknowledges the Cammeraygal people, Traditional Custodians of the land on which this publication is produced, and pay our respects to their Elders past and present. We extend that respect to all Aboriginal and Torres Strait Islander peoples today.*

AUSTRALIAN Woodsmith GO On-Line Extras

This symbol lets you know there's information online at: www.australianwoodsmith.com.au. There you'll see bonus cutting diagrams, articles on techniques, jigs and a lot more. If you don't have access to the internet, contact us on (02) 9439 1955.

TIPS FROM OUR READERS



BEER CAN SOLUTIONS

With no clear glass jars available I decided to have a go at making a brush container out of an aluminium beer can. All it took was a sharp blade and a pair of scissors. As you can see I sliced the top off the can with a blade and then cut four 30mm-long "tongues", folded them in half and then tucked them under to form a safe edge. Who said you can't square a circle! *Ross Hughes*

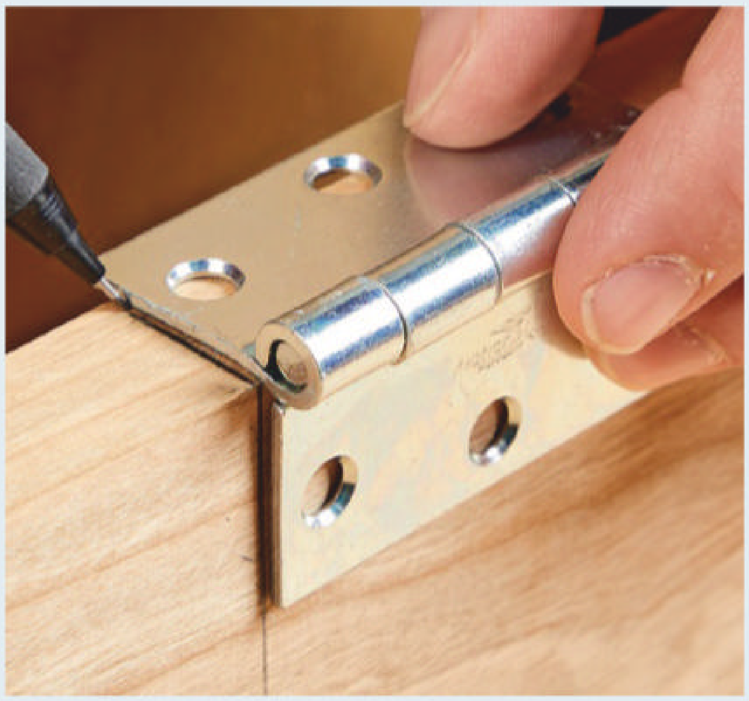
Tips & Techniques

QUICK TIP

HINGE SADDLE SQUARE

I misplaced my square and in a moment of insight realised that I had a make-shift square sitting on the bench right in front of my eyes. As you can see, a hinge can be used as a saddle square, just line it up and mark away! So simple and yet so handy.

Harold Ebbletrap



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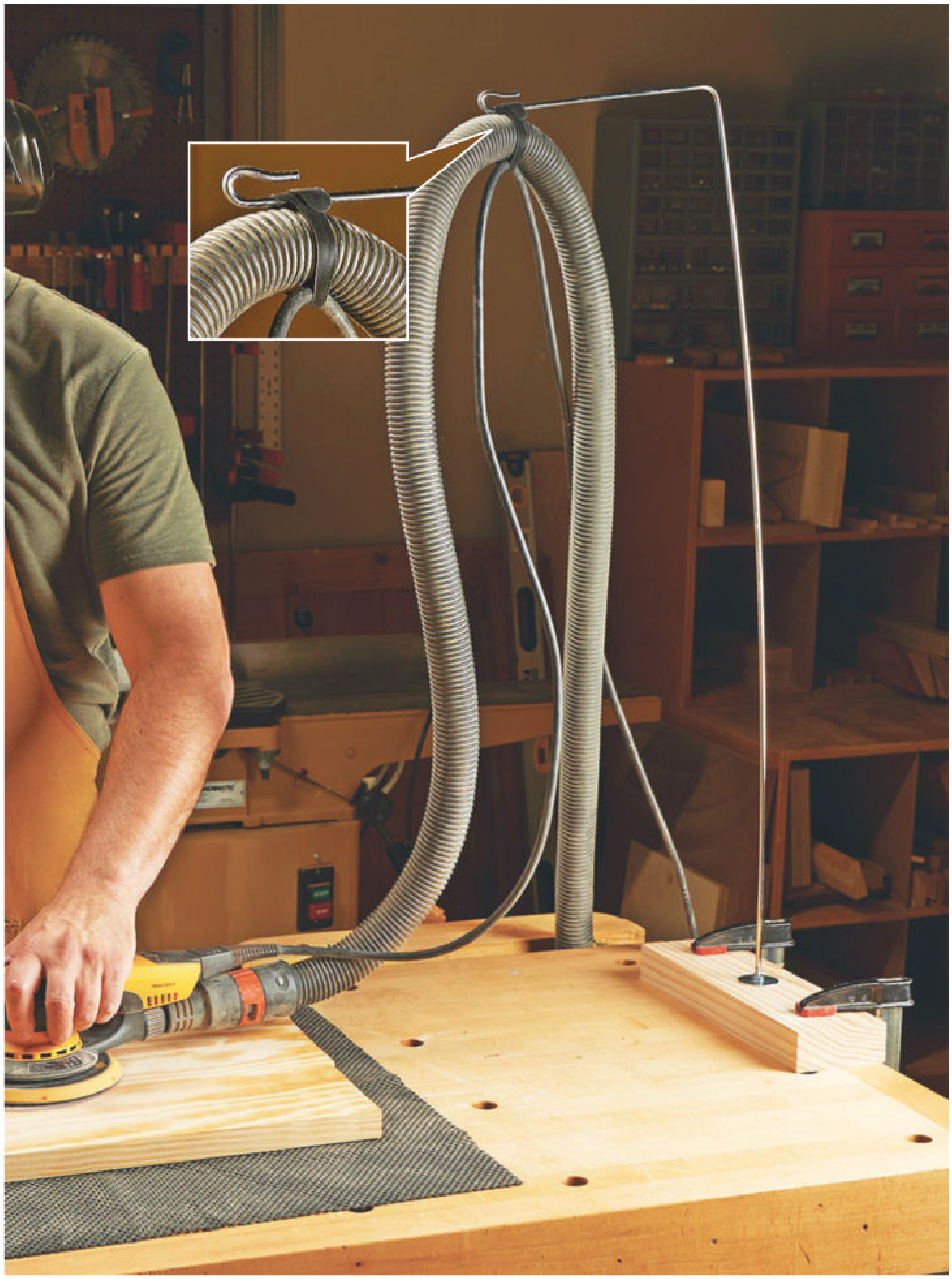
SAFETY IN THE WORKSHOP

Safety devices, such as riving knives, guards on table saws and guards over router bits have been deliberately left out of the line drawings in Australian Woodsmith projects in order to make them easier to follow. It goes without saying that where safety devices have been supplied by the manufacturers you should use them. We encourage the use of push sticks as good work practice.

Exercise vigilance and the greatest of care when using power tools, whether stationary or portable. Keep all your tools sharp and well maintained. Wear protective eyewear, a dust mask and a hearing protector when appropriate. By limiting distractions and developing safe work practices you will go a long way to avoiding workshop accidents. So, work safe fellow woodworkers. -Editor

HOSE SWING ARM UPDATE

Orbital sanders are a godsend, which is why I appreciated the swing arm tip from a previous issue (photo below). When I recently replaced the cloth bag on my dust collector, I had an idea. The arm that held the bag looked to be about the same size as the swing arm in the picture. The arm I used had a threaded end, so I took a piece of scrap, drilled a hole through it, then created a counterbore on the bottom face to accept a nut and washer. I threaded one nut and washer set onto the rod, slipped the rod through the hole, then added the second nut and washer set into the counterbore, sandwiching the scrap. Clamping the scrap to the edge of my workbench holds the arm in place. Lastly, I fastened the hose and cord of my orbital sander to the top of the old arm. *Ken Erickson*



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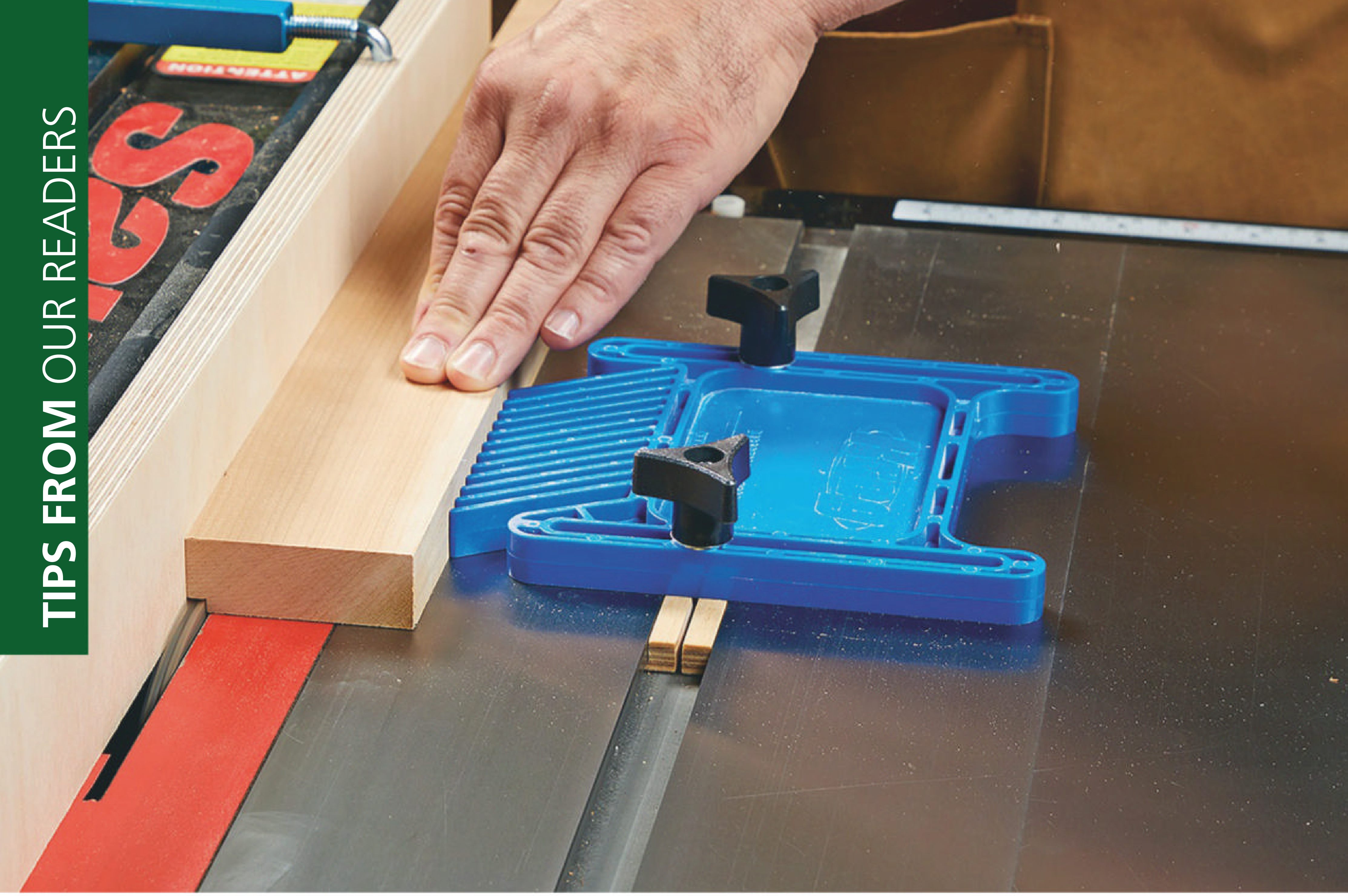

FEATHERBOARD RAIL

Whether it's at the table saw or router table, a featherboard can be a useful accessory to keep a workpiece firmly in place and your hands at a safe distance. However, the rails that come with them won't always be a perfect fit.

The workshop-made rail you see above matches the mitre slot exactly, ensuring the board stays right where you need it. The rebated edges keep the rail from pulling up, and the kerfs (along with the wedge-shaped heads of the machine screws) lock it in place when tightened, preventing it from sliding in the slot.

Dan Martin

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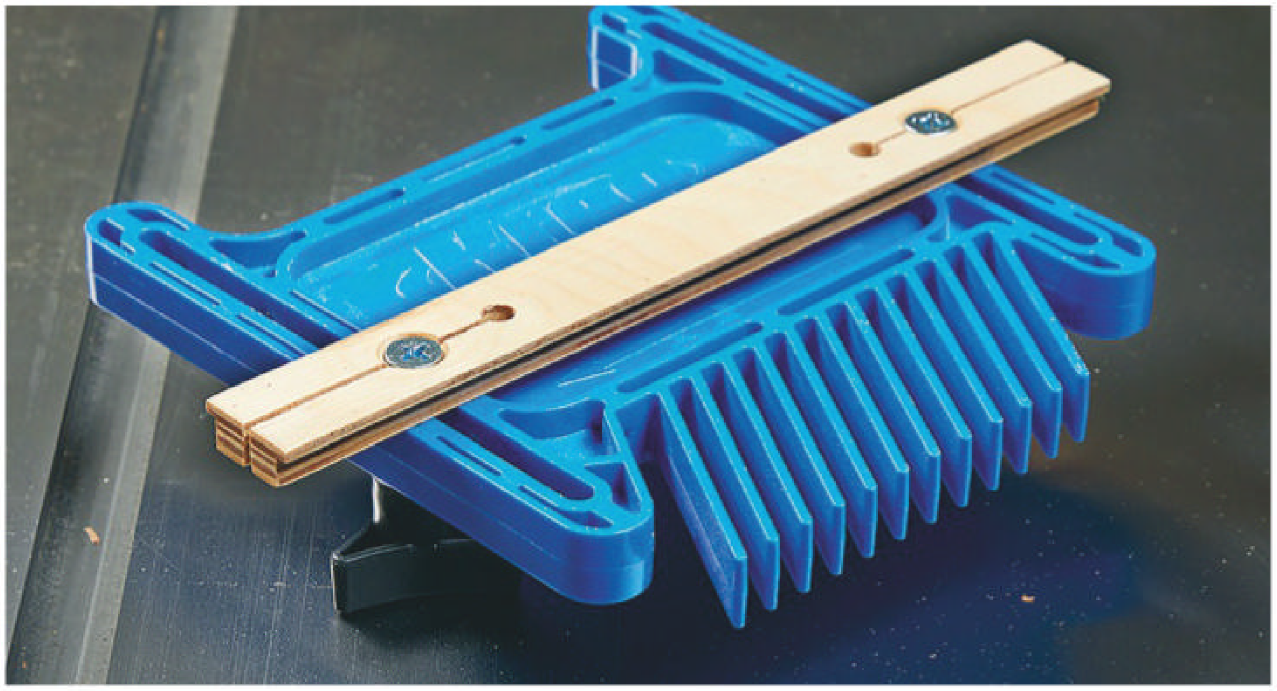
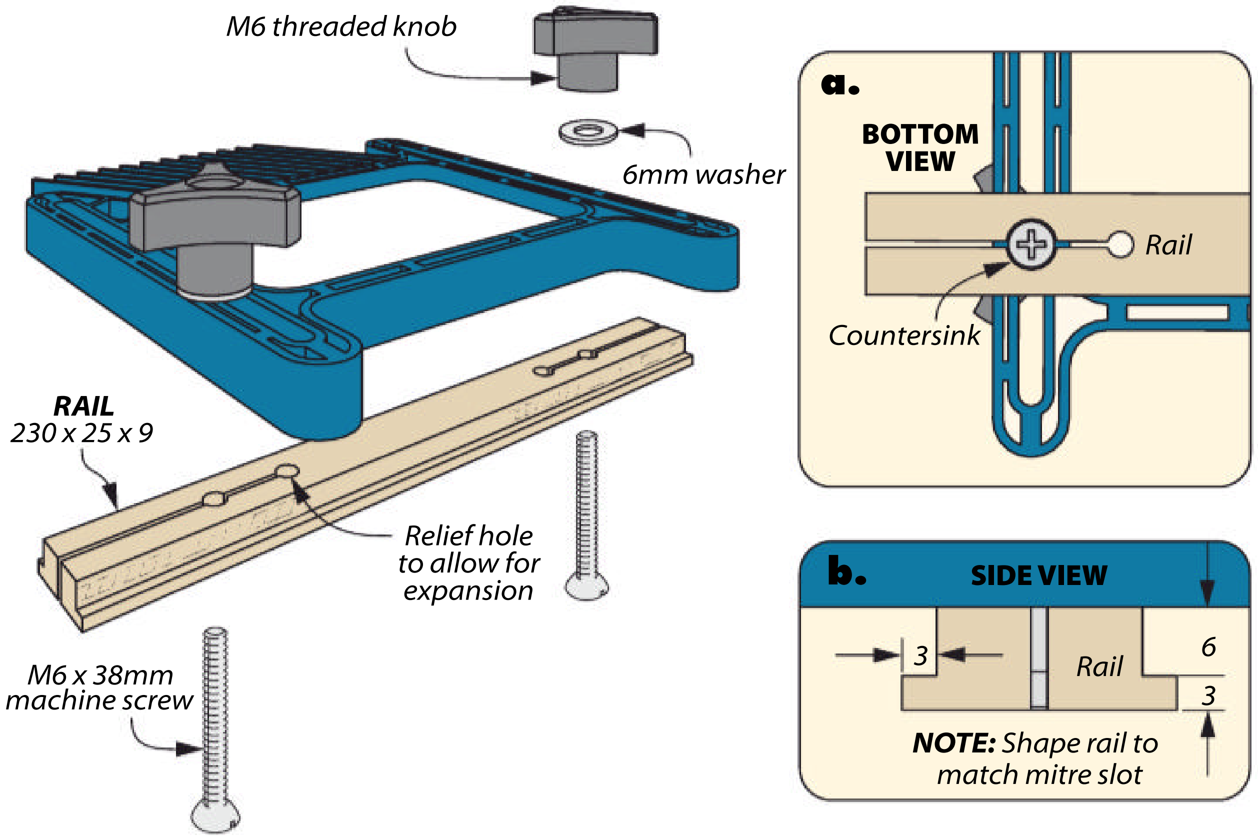


▲ The handmade rail expands as the knob draws the screw, keeping the featherboard locked in place.


M6 threaded knob
6mm washer
RAIL
230 x 25 x 9
Relief hole to allow for expansion
M6 x 38mm machine screw
a.
BOTTOM VIEW
Rail
Countersink
b.
SIDE VIEW
3
Rail
6
3
NOTE: Shape rail to match mitre slot

QUICK TIP

COLOURED SCRAP

When I was drilling a series of holes in a project I nearly drilled through the scrap beneath the workpiece and into the bench. To make sure I wouldn't mar the benchtop, I switched to a scrap piece of a different colour, that way I could see when the shavings changed.

Becky Kralicek

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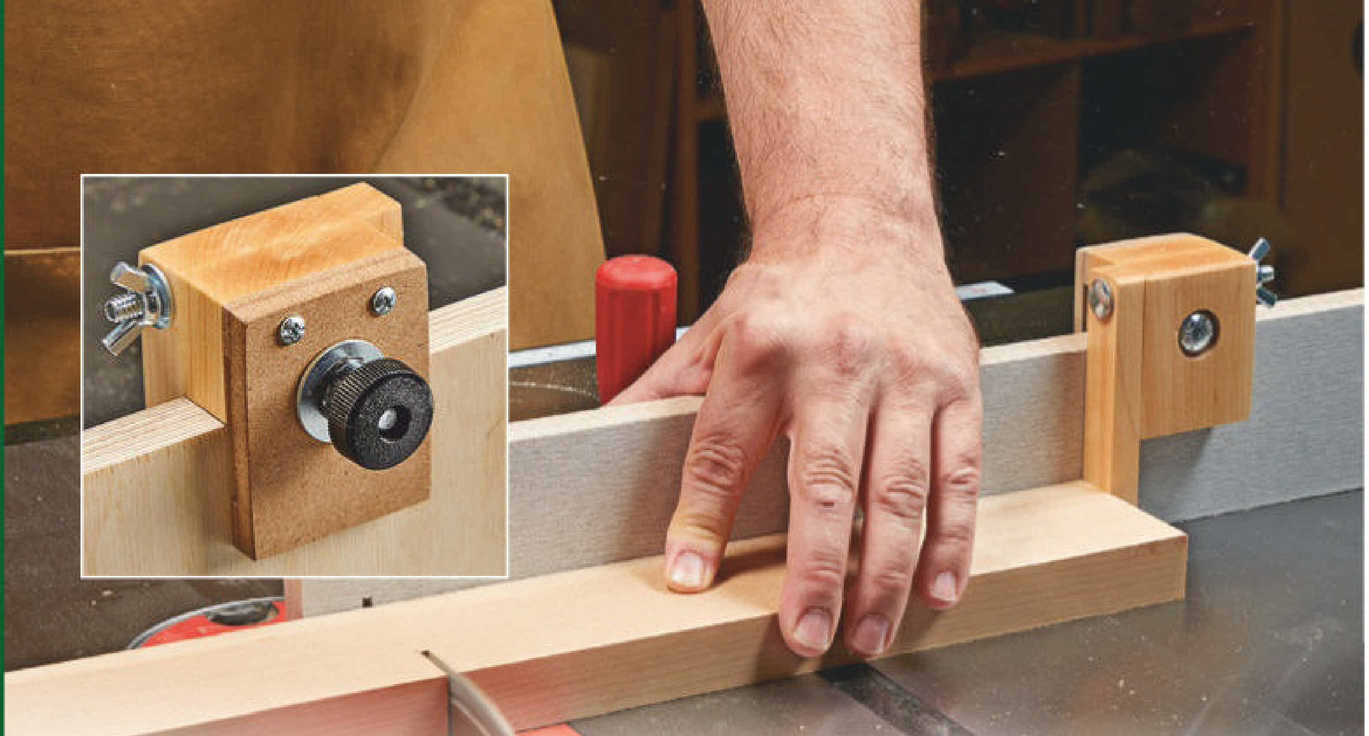


With the block tightened against the fence, the flip stop makes it easy to slide a piece in place and align it for a perfect cut.

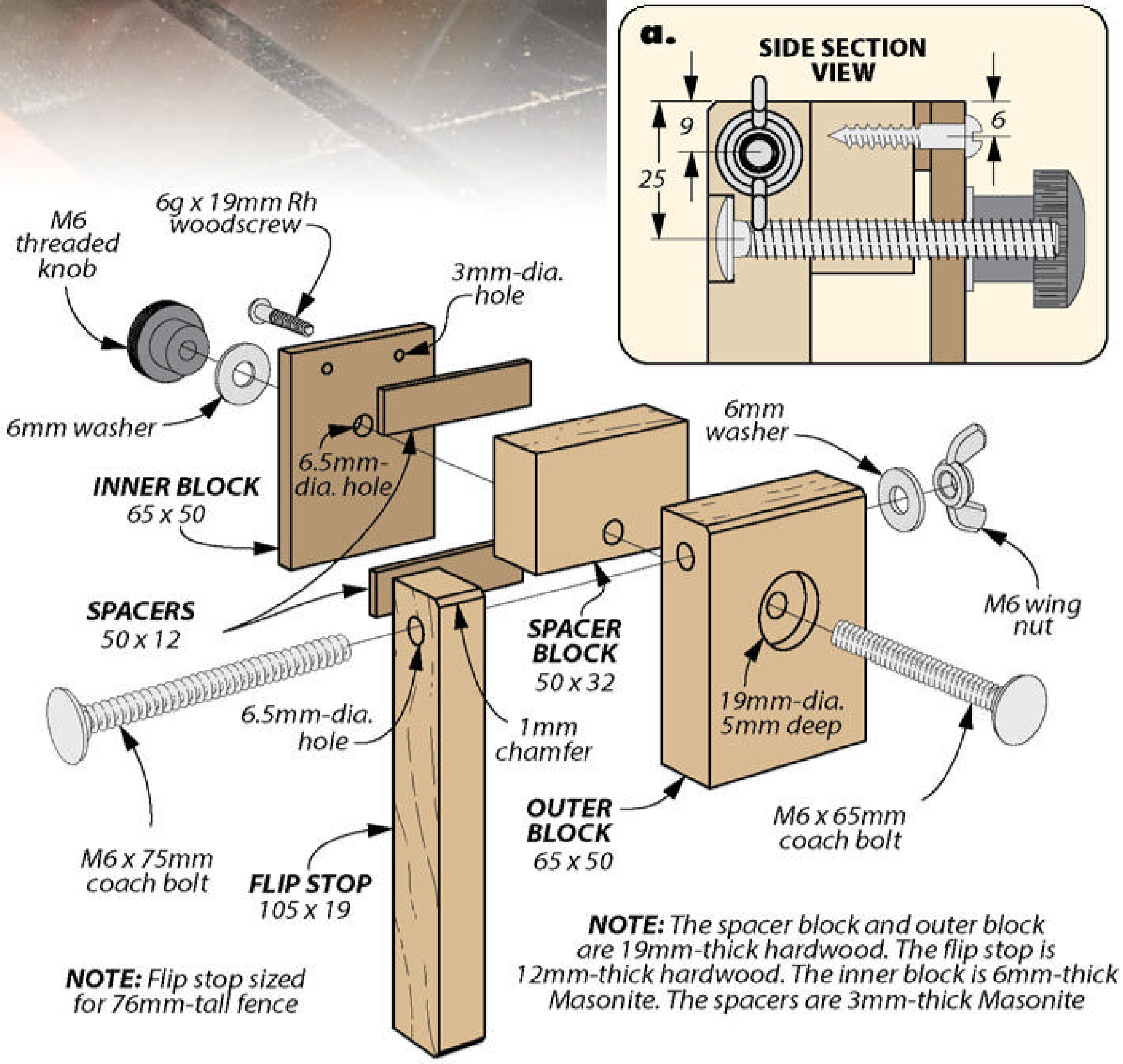
MITRE GAUGE FLIP-UP STOP

While the table saw can be one of the most reliable crosscutting tools in the workshop, it isn't easy to get consistent cuts when using it. Multiple cuts will often leave pieces longer or shorter, unless you're using a stop block. The flip-up stop block you see here makes crosscutting multiple, identical pieces a breeze.

As shown in the illustration at right, the flip stop is fastened to a block with a bolt and wing nut. The block is bolted to a piece of Masonite, which forms a clamp that fits over the mitre gauge fence, then locked in position by a plastic knob.

Using the stop is easy. Turn the flip stop up, then square up one end of the workpiece. From here you can quickly flip the stop back down for each cut. The flip stop here is sized for a 76mm-wide fence, so size yours according to your fence's height.

Rusty Shackleford


a.
SIDE SECTION VIEW
9
25
6
M6 threaded knob
6g x 19mm Rh woodscrew
3mm-dia. hole
6mm washer
INNER BLOCK 65 x 50
6.5mm-dia. hole
6mm washer
M6 wing nut
SPACERS 50 x 12
SPACER BLOCK 50 x 32
19mm-dia. 5mm deep
6.5mm-dia. hole
1mm chamfer
OUTER BLOCK 65 x 50
M6 x 65mm coach bolt
M6 x 75mm coach bolt
FLIP STOP 105 x 19
NOTE: Flip stop sized for 76mm-tall fence
NOTE: The spacer block and outer block are 19mm-thick hardwood. The flip stop is 12mm-thick hardwood. The inner block is 6mm-thick Masonite. The spacers are 3mm-thick Masonite.

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Next issue of *Australian Woodsmith* on sale 20th April 2023 - Issue 176

In our next issue we present some chisel tips to make your time in the workshop more productive. We detail how to install European-style concealed hinges and then use this technique when making a fine tool cabinet for the workshop. The garden and our native bees get a hive built in a weekend while the heirloom project is a handmade backgammon board. The designer project is a hall bench with tapered legs. Finally, the lathe gets used to spin colour wheels that will truly amaze you.

As usual we feature clever tips and techniques from our generous readers.

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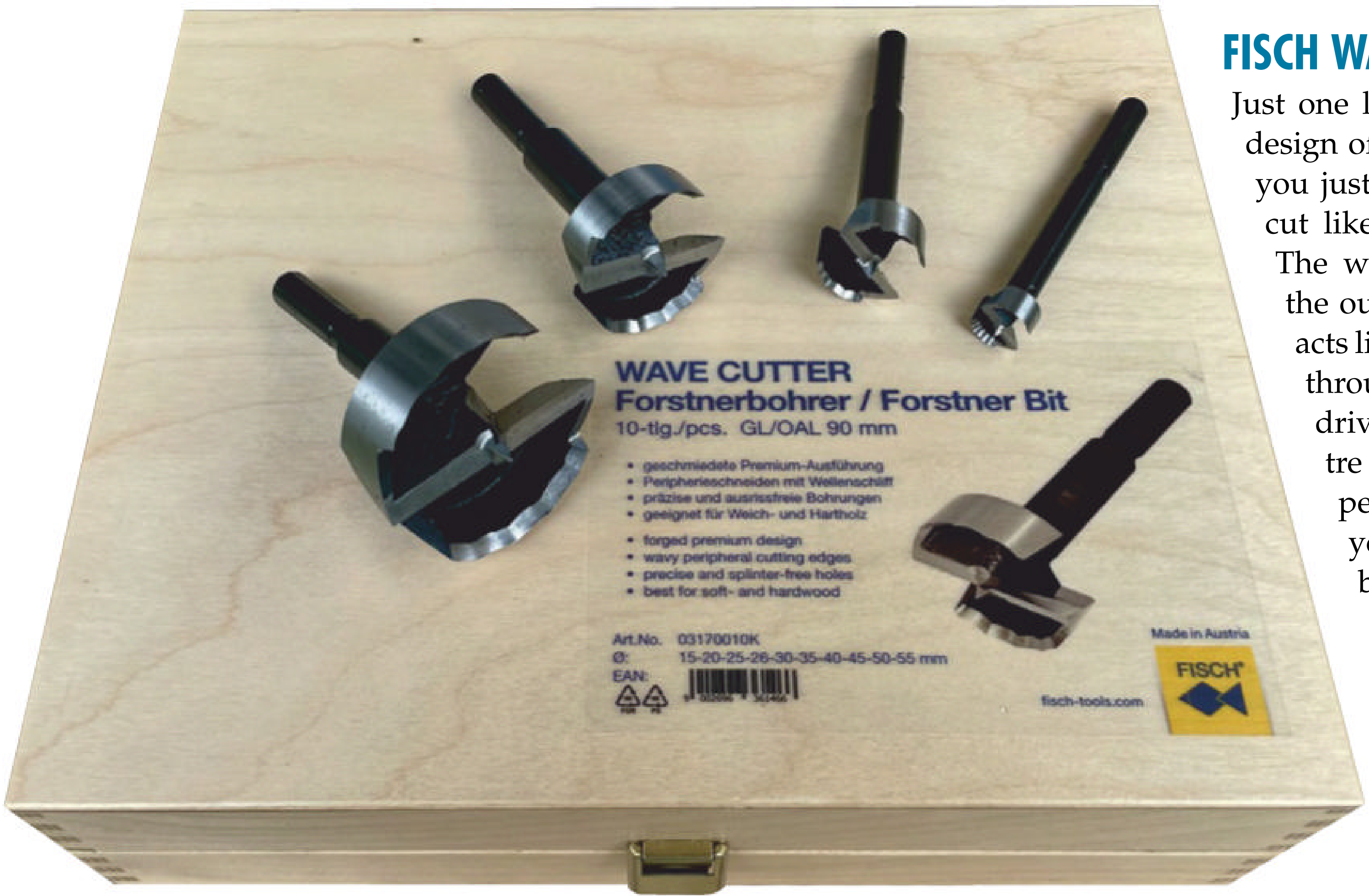
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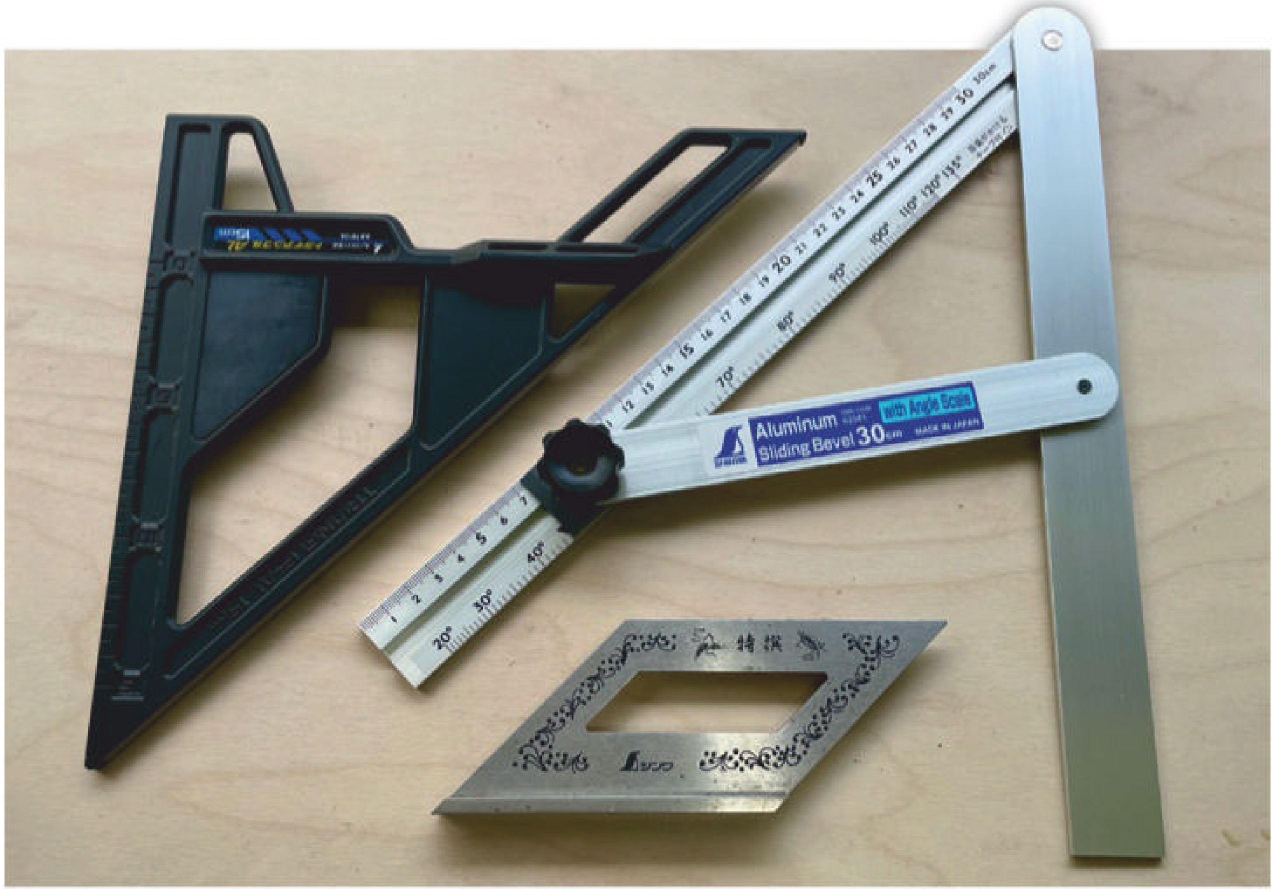
Most Forstner bits struggle when presented with the challenge of cutting through Australian hardwoods. The clever wave design of these bits has them power through softwood and hardwood sections with ease. The full box of cutters covers 15, 20, 26, 30, 35, 40, 45, 50 and 55mm diameter bits but you can buy each bit as you see fit. Available from Timbecon (timbecon.com.au).

SHINWA SLIDING BEVEL

Japanese craftsmen think outside the box. Their saws and planes are designed to cut on the pull stroke, they often sit on the floor and use their feet as a vice, plus they use a centre datum for marking out instead of an edge. All very different from the Western ways that have become the default techniques we use.

Thinking outside the box is what Shinwa has done with the sliding bevel you see at right. Shinwa makes excellent mitre squares perfectly manufactured to 45°, however sometimes you need angles in between. This is especially the case if you are cutting the right and left stringers for a staircase. What is so remarkable about the design of the sliding bevel shown here is how it flips into a mirror image of itself in a flash. Once you have set the angle and marked out your lines, you can unlock the bevel and open it up so it forms a straight edge, then keep the motion going and pivot the rule to the other side of the scale! Awesomely clever!

The sliding bevel is available in 30, 45 and 60cm lengths. Drop into Japanese Tools Australia to see the whole range of clever Shinwa marking and measuring tools. (japanesetools.com.au)


Aluminum Sliding Bevel 30cm
with Angle Scale
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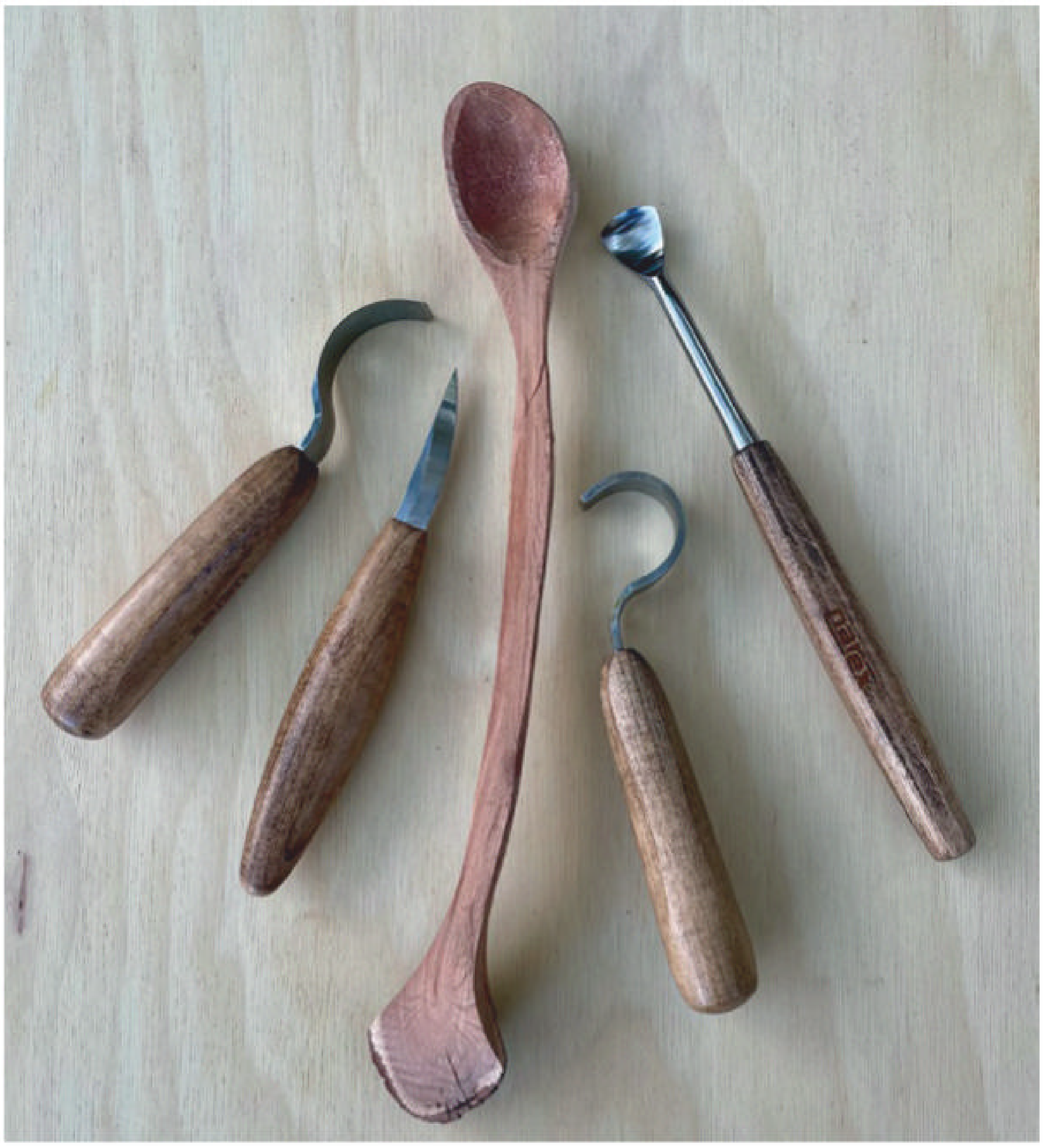
NAREX SPOON CARVING KIT

Narex hails from the Czech Republic and has been making chisels since 1919. What sets this company apart from others is the cryogenic hardening process that is used to lock the crystal structure into a premium state for sharpening and edge retention.

The Sloyd blade, hook knives and spoon chisel are all made from chrome-silicon alloy steel that is then ground to shape and lapped by hand with abrasive paste before being honed on Arkansas stones. The blade on the Sloyd knife is longer and thinner than a standard Sloyd knife, while the deep and shallow hook knives worked well (I am right-handed and purchased the right-handed kit).

The standout winner in this set of four carving tools was the long-handled spoon carving gouge. It dressed the cove I cut with the hook knives perfectly. If you are a spoon carver and enjoy the fortuitous designs that evolve out of the branch or limb at hand then this kit is excellent value. However, if you have a standard kit of hook knives and a Sloyd blade you will be doing yourself a favour if you add the spoon gouge to your kit. Available from Timbecon (timbecon.com.au).



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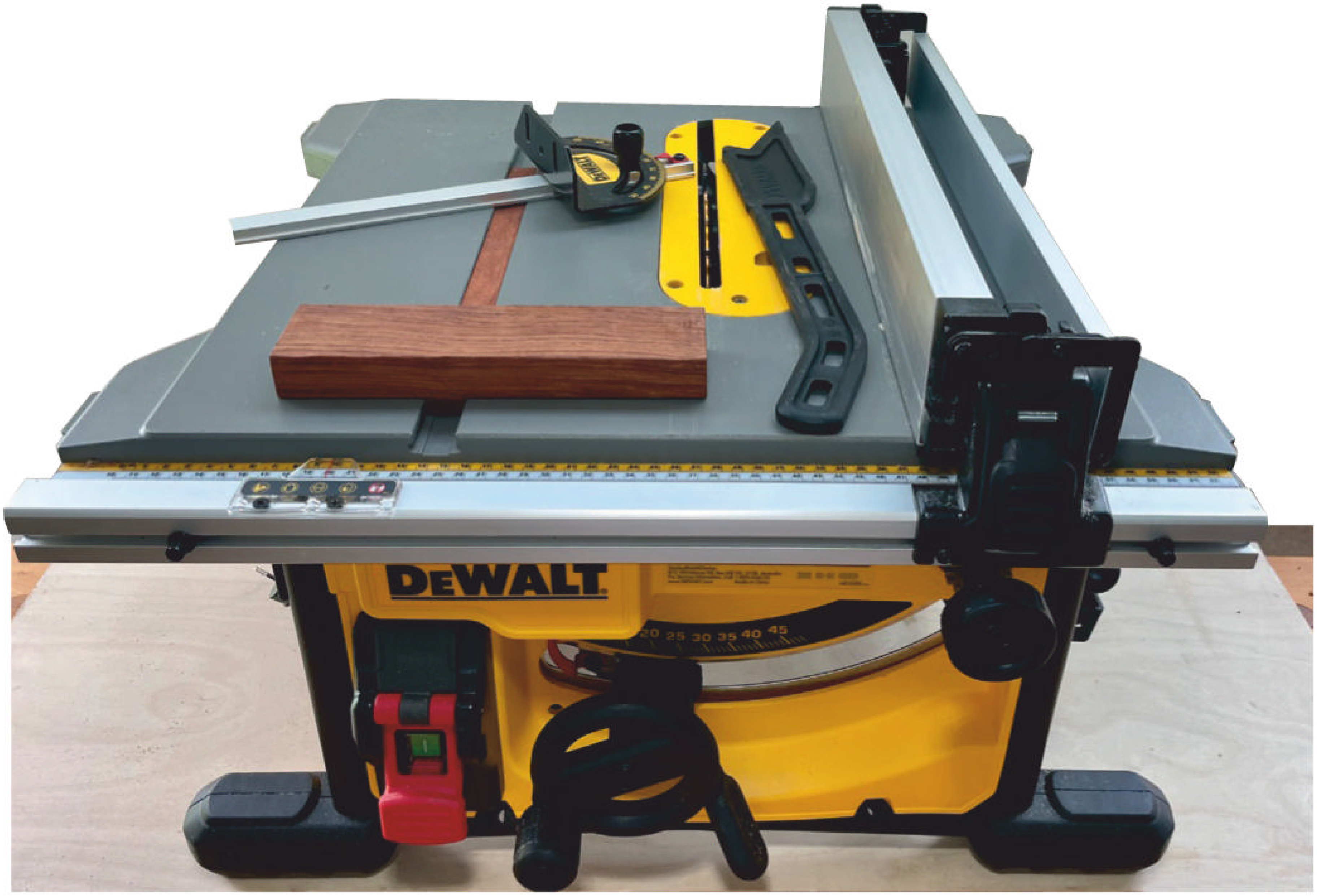

DEWALT CONTRACTOR SAW

If you are looking for a saw priced under $1000 you will find a wide variety to choose from. The style of saw that you will find is the more portable contractor-style saw and not a dedicated table saw. The difference is that a table saw is heavy and meant to sit permanently in the workshop, while a contractor saw is compact and designed to travel to the worksite.

It is the compact nature of the DeWalt saw that first caught my eye. I realised I could pop it under a bench and keep it out of the way in the home workshop. The first thing I did right out of the box was to use the saw itself to cut the sections for a cabinetmaker's cross-slide. Contractor saws are designed for carpenters and not cabinetmakers, the cross-slide fits loosely in the groove, OK for framing stock but not OK for accurate cabinetmaking cuts.

The one thing that sold the saw was the rack and pinion adjustment of the fence. Once you have adjusted it to the width of your cut you lock both sides down and just know that the fence is parallel to the blade and perfectly accurate. The point here is that contractor saws are built for a different market than table saws. You can hack a contractor saw and bring it up to spec by checking all the settings, adjusting them so they are true and then making your own bespoke cross slides.

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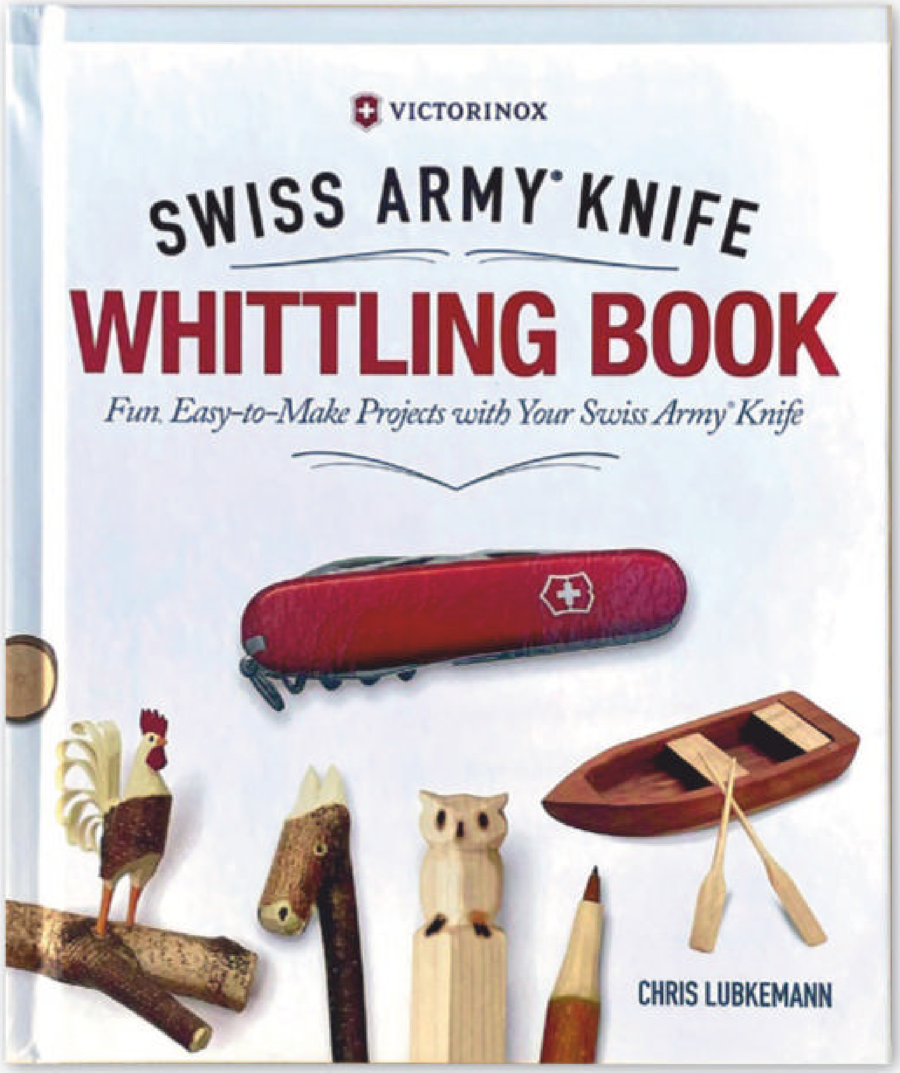
SWISS ARMY KNIFE WHITTLING BOOK

Chris Lubkemann pays homage to a simple Swiss Army knife in this delightful 192-page hardback. The Swiss Army knife is the world's most popular pocket knife. It has many iterations but the one that Chris uses to carve his clever creations is a simple two-bladed version with the key ring removed. Chris changed the profile of the narrow blade and made it even narrower so that he can shave the feathers you see on the rooster to the left of the cover.

Whittling has been a constant hobby since he was a boy growing up as the child of a missionary couple in Brazil. His skill level improved to the point where he was able to sell his creations and subsidise the cost of his final year at college.

The book starts with an introduction to the founding of the Swiss Army knife in 1884 and its use by soldiers and officers alike in the Swiss army. Chris then introduces a range of modern knives before taking the reader through the steps required to customise the blade and hone it to perfection. This is followed by chapter 2 that details utensils that can be whittled with a pocket knife. Chapter 3 has a focus on toys, 4 is all about branch animals and 5 features curl creations like the rooster. The final chapter uses the saw from a larger Swiss Army knife to cut coasters, checkers and napkin rings.

If you were going to give a Swiss Army knife as a present then this book should also be part of the package. Available from Fox Chapel Publishing (foxchapelpublishing.com).



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Undetected nails, screws or other metal fragments can damage expensive jointer, planer and saw blades. Easy to use, the Lumber Wizard #5 helps woodworkers prevent equipment damage and personal injury. The unit includes a beep tone alert, allowing use of the Lumber Wizard #5 with or without the laser activated. The Lumber Wizard has received enthusiastic reviews from woodworkers and magazines across the country for over 10 years and the new version #5 is even better with these new features!

Helps prevent costly damage to woodshop equipment

Only $246 (plus P&H $25)

Laser-Line Visual Indication

- Fully Automatic Tuning
- Bright laser-line indicator
- Helps pinpoint nails, screws, bullets and wire inside new or used lumber
- Helps prevent costly blade damage and shop down time
- Quickly scan any size wood
- Not affected by moisture content of wood
- 6"(150mm) wide scanning area
- Durable, sturdy plastic casing
- One 9 volt battery required
- 1 year warranty

HUGE range of Spiral Cutter Retro-fits currently available. Call or email us to find a Spiral Cutter to suit your machine

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Vibration in the Workshop

Power tool vibration limits are a European norm. We need to take note.

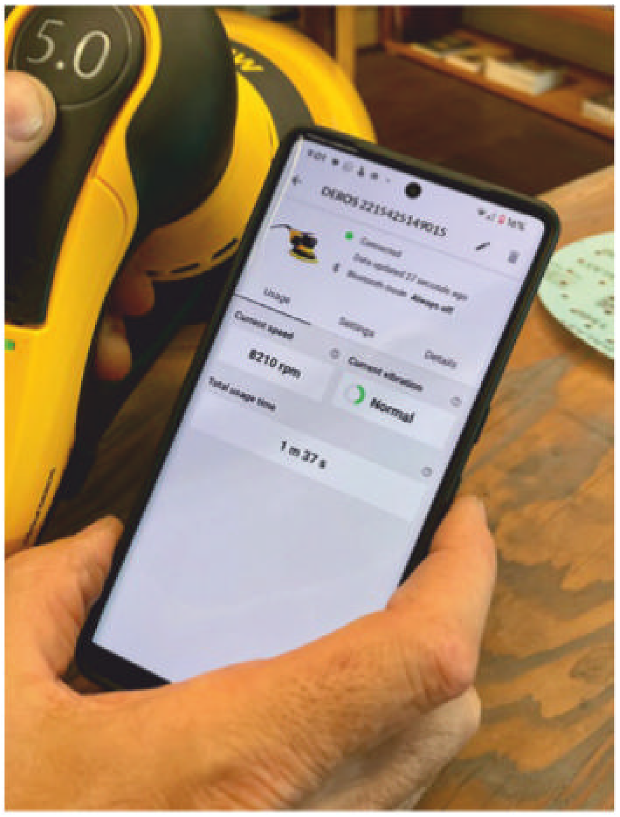
Ten years ago, I was given a Mirka Deros to review and was very impressed with just about every feature of the clever brushless machine and the Abranet sanding discs that came with it. That was until it just stopped! I called the company and they dispatched a replacement, plus a technician to diagnose the problem. The technician asked me how long I had used the machine for and what rpm I had run it at. He opened his laptop and then pressed the Deros sander's rpm button and ON button at the same time. A clever Bluetooth chip in the sander communicated with the software on his laptop and gave him a history of the machine. It matched both the time and rpm that I had stated. Just amazing!

WHITE FINGER

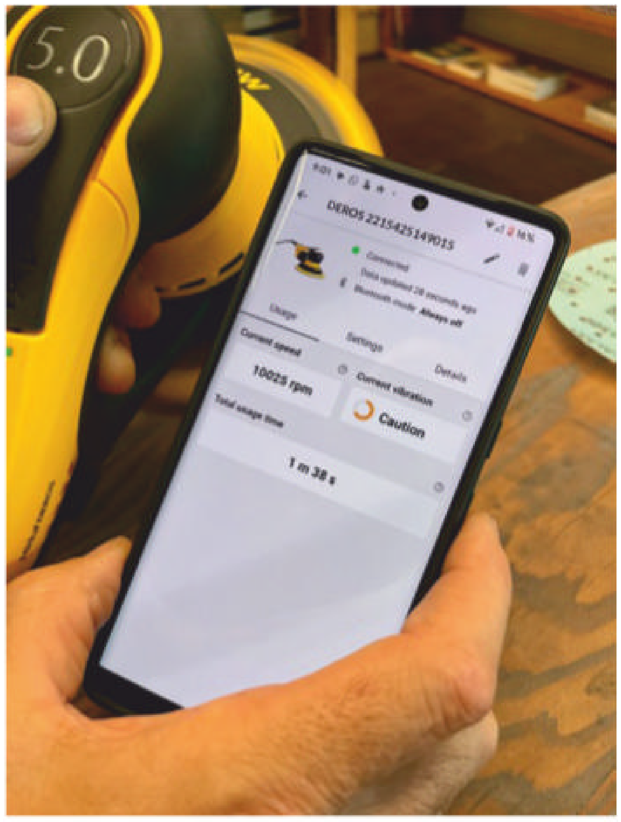
In order to allow workers and business owners to monitor vibration levels in their sanders Mirka has released an app that gives users similar information the technicians get when they engage their software.

The reason why Mirka has released this app is so that European employers and workers alike can monitor vibration and make sure that working conditions comply with DIRECTIVE 2002/44/EC. This directive details the amount of vibration that a worker can be exposed to so that blood vessel and nerve damage is kept at bay and the worker can enjoy a long and full career with hands that function in their retirement.

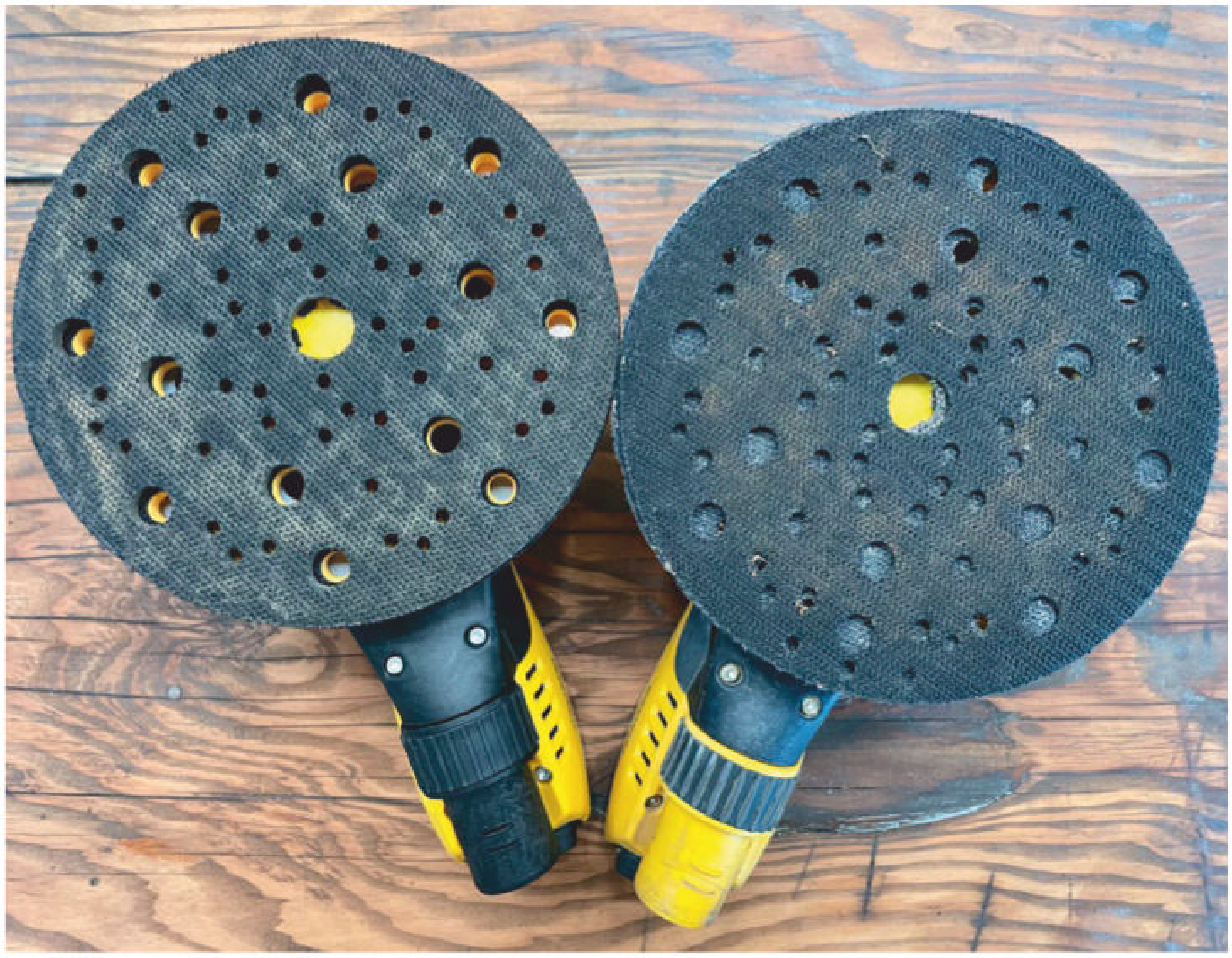
The issue at hand is hand-arm vibration (HAV) that can lead to "white finger" and a loss of fine motor skills



▲ The Bluetooth app communicates the rpm, duration of time and the level of vibration instantaneously.



▲ When the vibration level in the machine strays beyond safe limits a caution note appears.



All sanders (Mirka, Makita, Festool etc) are factory balanced. When you add a pad saver or other interface you need to centre it very carefully.

and feeling. It is often diagnosed as carpel tunnel syndrome and is sadly permanent.

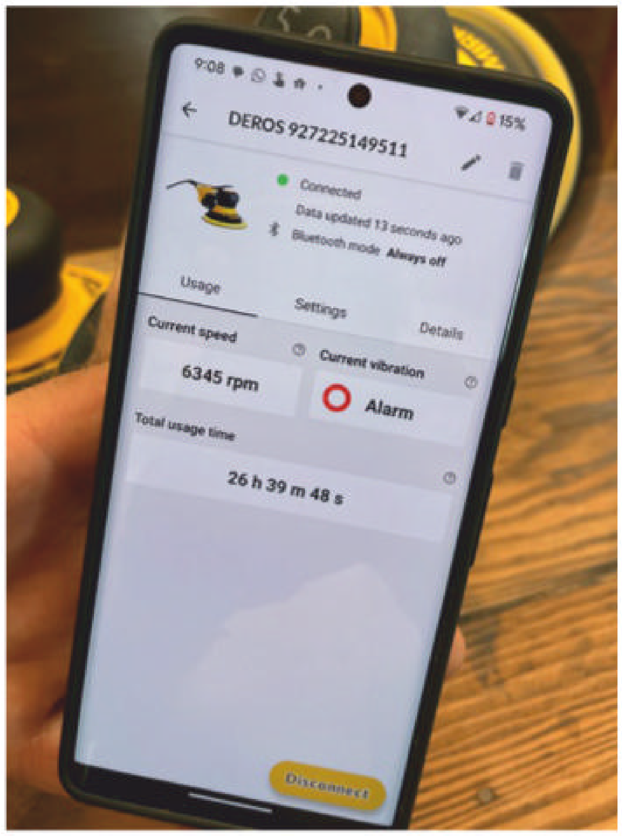
The app gives you instant feedback about vibration, rpm and duration of usage. Bad habits can be corrected and best work practice can be noted so that machines can be programmed to run at the optimum rpm for the job.

Mirka has won many awards for their innovations. Well done, guys!

PAD SAVERS

There is one born every minute and it may be that the next person to use your disc sander will press too hard and not let the abrasive do its work. When too much pressure is applied to a disc sander it stresses the Velcro hooks on the pad and shears some off. Over time you will find the sander does not "grip" the abrasive disc and the only way forward is to part with more than $100 for a new pad. This is where pad savers save you both time and money. Pad savers act as a fine layer between the pad and the disc and are a much cheaper option than buying new pads.

A thicker type of pad saver allows you to sand contoured surfaces. These discs are called interface pads and are the same as pad savers but with the addition of a layer of foam in between.



DEROS 927225149511

Connected

Data updated 13 seconds ago

Bluetooth mode: Always off

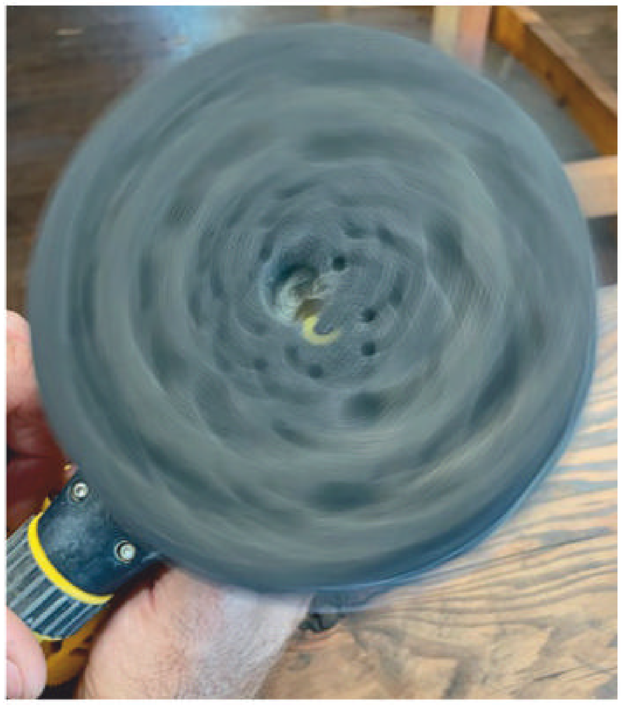
Current speed: 6345 rpm

Current vibration: Alarm

Total usage time: 26 h 39 m 48 s

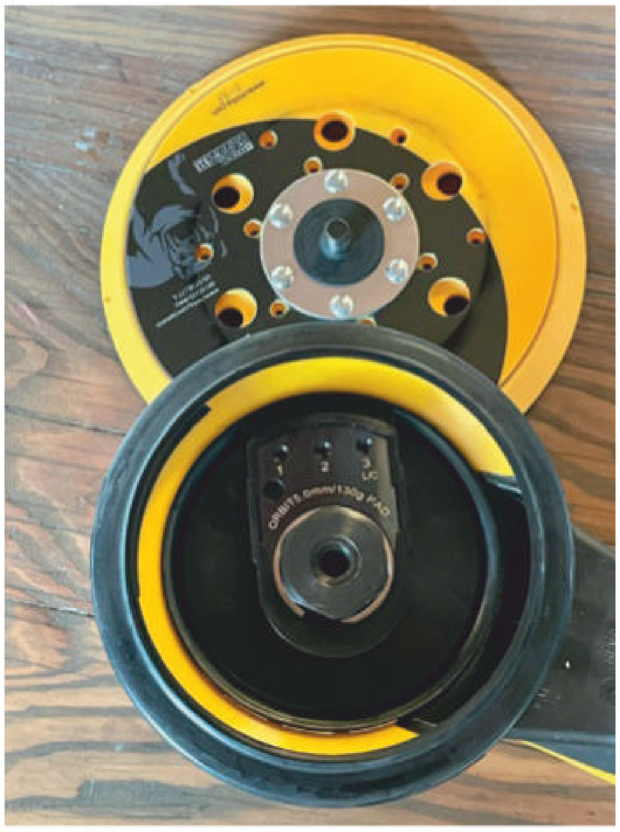
The software in the sander can be programmed to switch the machine off when it enters the "Alarm" vibration zone.

The image top right speaks volumes about how the machine itself will vibrate violently if the disc saver is not perfectly centred. This is easily done just by lining up the holes on the pad with those on the disc saver. The interface pads are different. They weigh significantly more than the disc savers and require weights to be added to the offset block that controls the orbit of the sander.



The machine above has the pad saver just off centre. Notice how violent the vibration is.

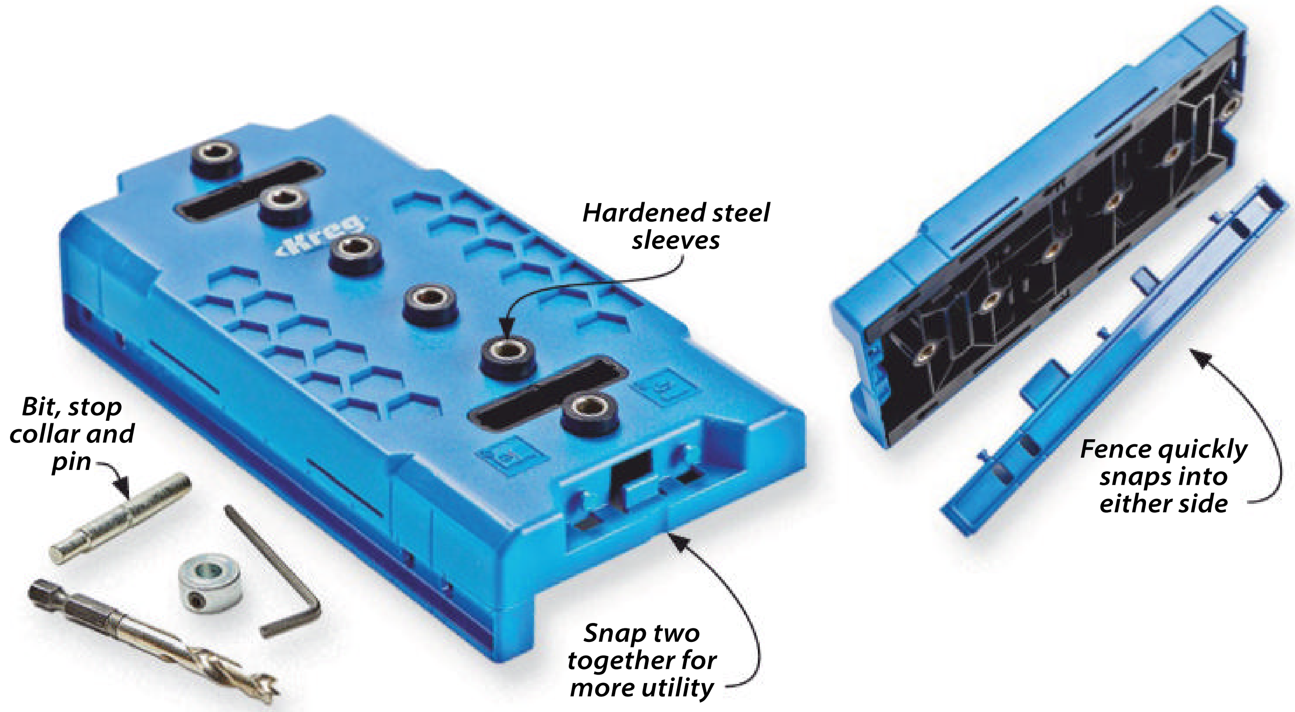
Disc savers and interface pads extend the life of the original pad and give you the ability to sand soft contours. The Mirka disc savers fit most machines.



One unique aspect of the Mirka system is the ability to tune the sander with bolts screwed into positions 1, 2 or 3.

Clever little helpers for a better Workshop Life

Kreg
Kreg
Bauer
20v


Hardened steel sleeves
Bit, stop collar and pin
Fence quickly snaps into either side
Snap two together for more utility

▲ The Kreg Shelf-pin jig is a well-thought-out jig that stows all the parts you need in the underside of the jig.

We always look forward to buying new tools for the workshop — the bigger they are the more exhilarating the process is. Here we're going to look at some smaller items that may not have the thrill of a new table saw but nonetheless make life better in the workshop.

SHELF PIN JIGS

In the pursuit of wanting shelf pin holes to be dead accurate every time, the jig you see here from Kreg Tools is up to the task. It comes in two pin sizes: ¼" and 5mm. Each section has six holes that are lined with hardened steel sleeves (photo, above). The jig comes with a removable fence that lets you flip the jig. Also, there's a bit to drill the holes, and a guide pin that lets you leap frog the jig for long runs of precisely placed holes. You can buy multiple jigs and daisy chain them together as well. The underside is moulded to store the drill bit and guide pin, I like that feature the most. The jig (and shelf pins with generously sized paddle supports) can be bought at Carbatec.

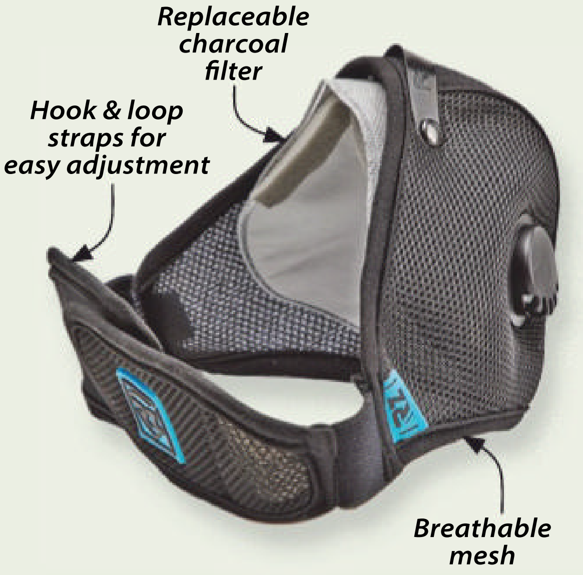
RZ INDUSTRIES

Here's a mask we can talk about without the heat of politics involved. RZ Industries makes the mask you see in the photos at right. As you see, the kit consists of the mask, two valves and a filter that's held in place by the valves. The package includes a carrying bag and two filters.

OPTIONS. The masks come in a variety of solid colours and some unique printed patterns as well. If you buy one of the creative shells, you'll have to harvest the valves and filters from your mask, or buy separate parts that are available at Timbecon.

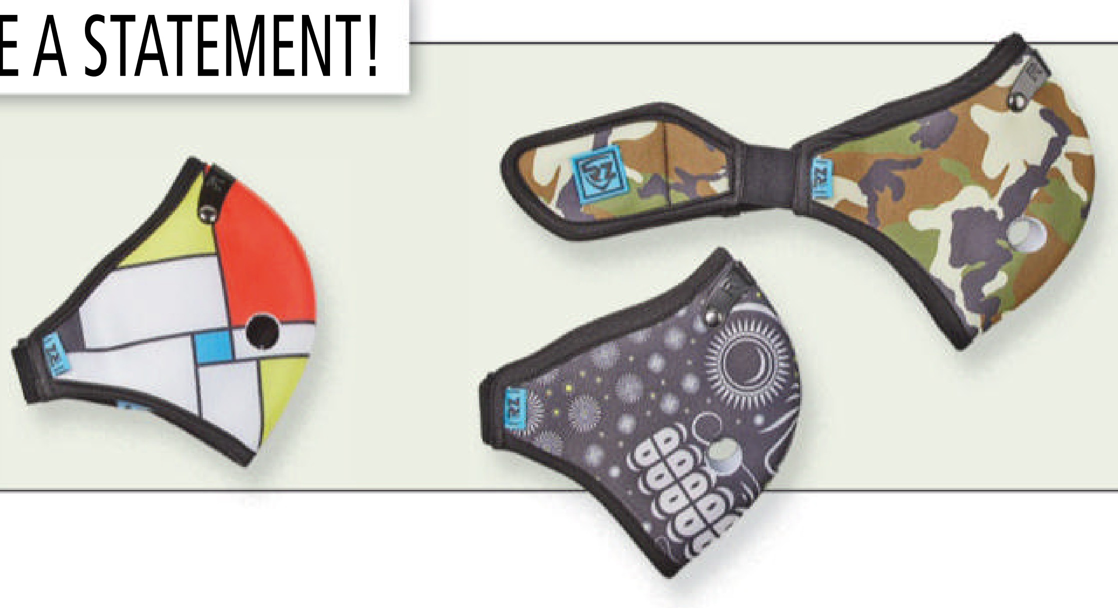
Both the M1 (the original neoprene mask) and the M2 nylon masks that are featured here have a large strap that joins comfortably with hook and loop. The metal nose bridge conforms around your unique schnozz.

▲ The standard mask from RZ Industries was tested by our workshop rats and received a thumbs up for comfort. The only downside was the sizing suggestions from the online chart. So order one size up from the chart.

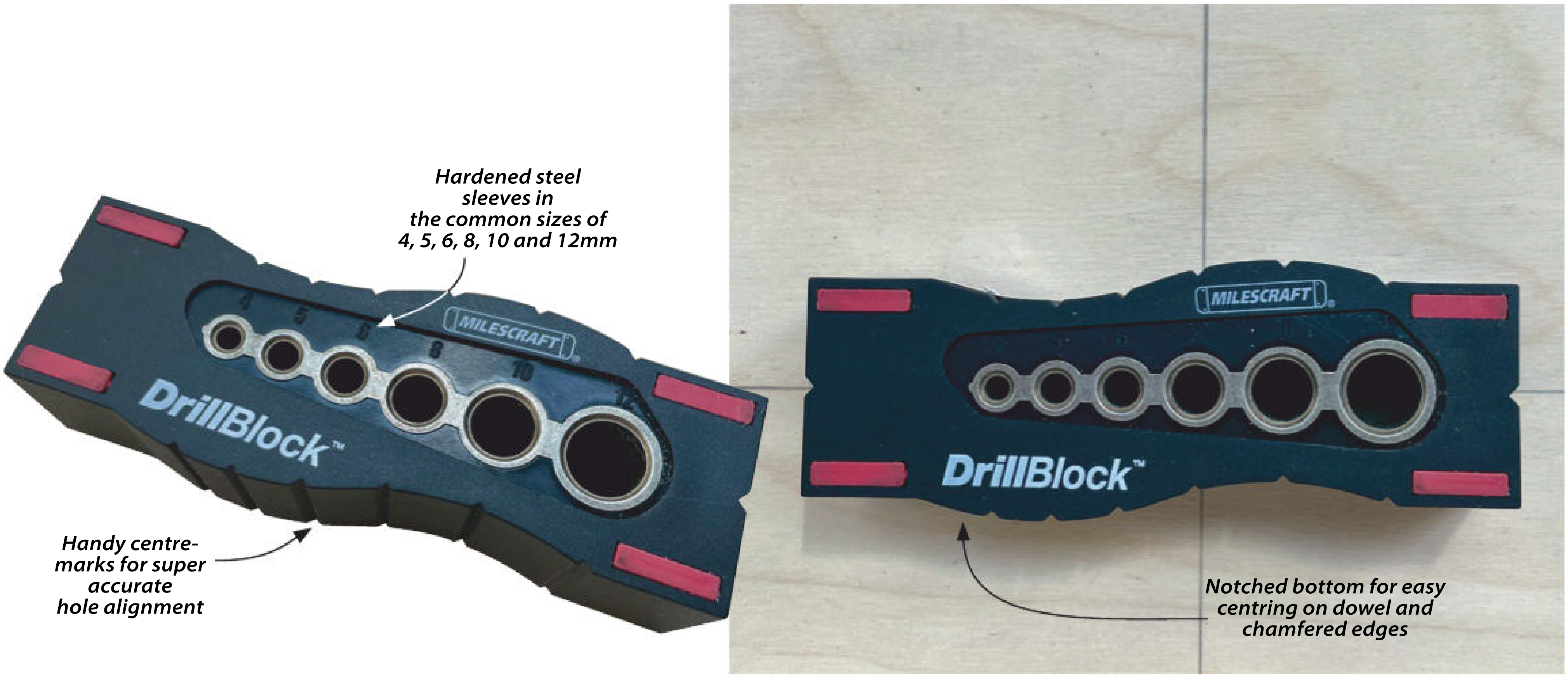

Replaceable charcoal filter
Hook & loop straps for easy adjustment
Breathable mesh

PARTS. There are two grades of filters to choose from. The F1 is the standard everyday filter. The F3, according to RZ Industries is more breathable and preferred by pros in the field of woodworking, construction and landscaping. Also, there are valve options that will expand your mask's performance. The masks and all the other accessories can be purchased from Timbecon.

MAKE A STATEMENT!



Bold Printed Masks. Doing the right thing by your lungs doesn't have to be boring. Shown here is just a sampling of the creative shells that RZ Industries offers to pair with your mask.


Hardened steel sleeves in the common sizes of 4, 5, 6, 8, 10 and 12mm
Handy centre-marks for super accurate hole alignment
Notched bottom for easy centring on dowel and chamfered edges
MILESCRAFT
DrillBlock™

▲ Milescaft drill guide block hole centring marks let you dial in a hole location on any surface.

DRILL GUIDE BLOCK

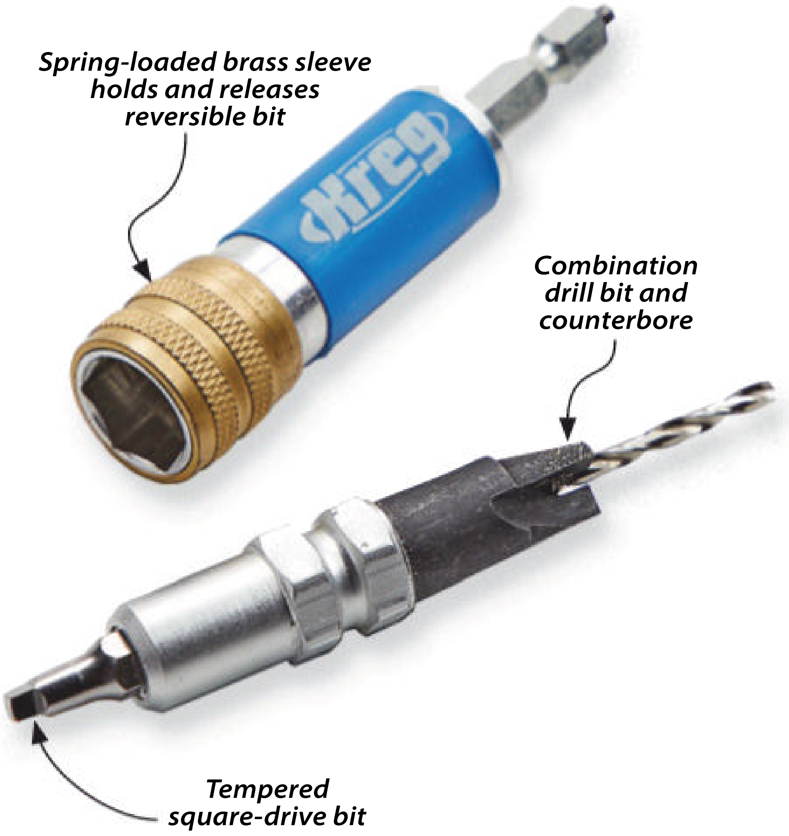
Whenever I needed to drill a hole in the edge of a piece of wood I would drag out my trusty dowelling jig. Not anymore. The Drilling Guide from Milescraft has put my dowelling jig in semi-retirement.

This little guy has a lot going for it. Like most Milescraft tools, the guide holes are lined with hardened steel sleeves. Rubber feet on the underside hold it in place while you drill holes. The 16mm-wide groove on its base cradles the side of the dowel plus allows you to drill 45° holes on the edge of square stock. But what sold me on the tool (photos above), is the hole centring marks on all sides of the block. This feature lets you align to marks and accurately drill square holes in any surface.

QUICK-FLIP

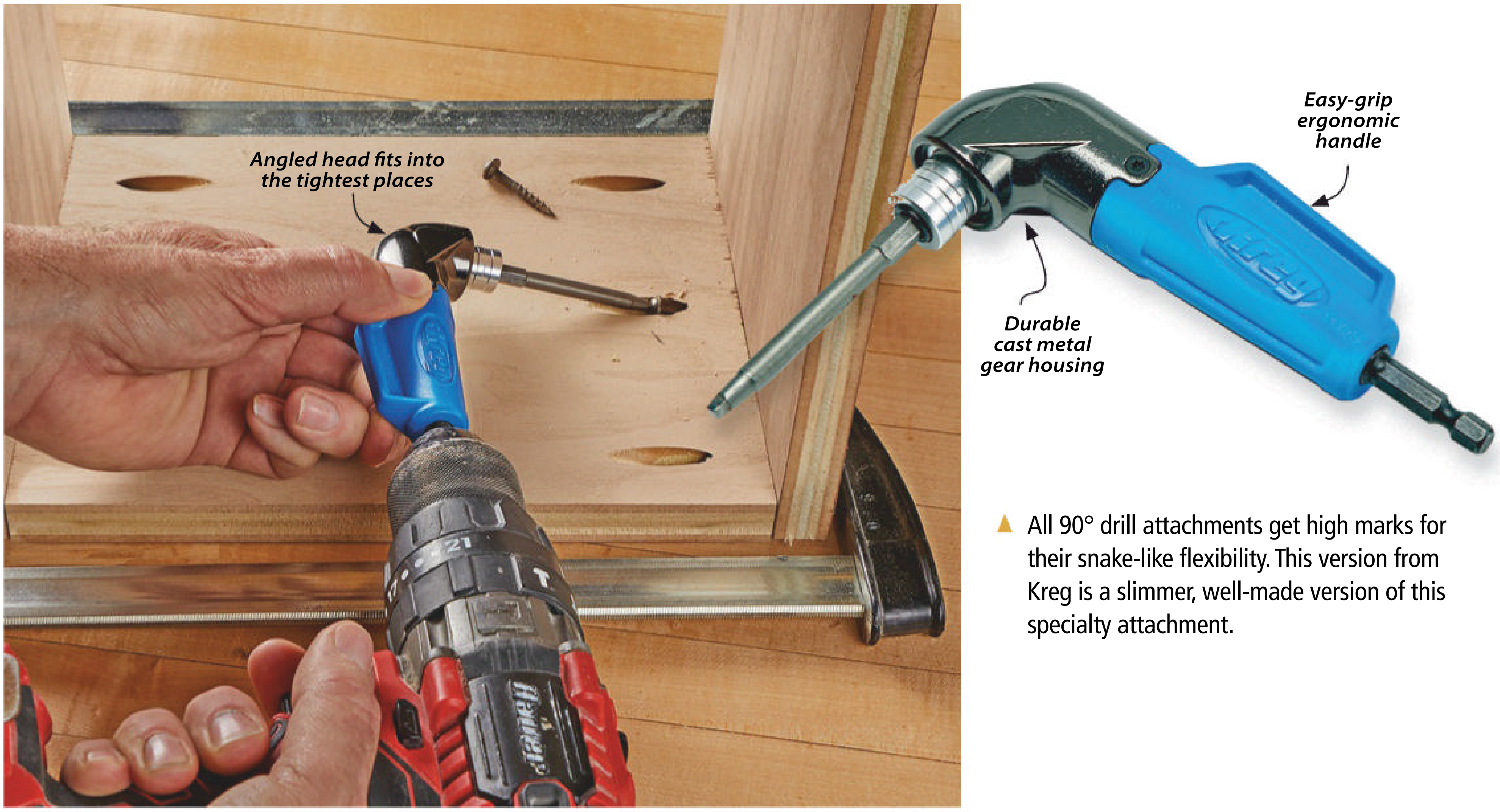
Fastening case parts together is one of those tasks that is somewhere between boring and annoying — but it's got to be done. The Quick-Flip you see below delivers you from the drudgery of having two drills set up for screw installation.

The bit side lets you drill counterbored holes. Then flip the insert and use the square head driver to set the screw (Kreg pocket screws, of course). Conveniently, there's a hex head on the end of the driver that lets you change or adjust the bit and driver on the insert.


Spring-loaded brass sleeve holds and releases reversible bit
Combination drill bit and counterbore
Tempered square-drive bit
Kreg

▲ First drill all of the counterbores to the desired depth. Then you can flip the bit to the driver side.

▲ The square bit works perfectly with any Kreg pocket screws. You can plug the hole with a 9.5mm dowel.


Angled head fits into the tightest places
Easy-grip ergonomic handle
Durable cast metal gear housing

▲ All 90° drill attachments get high marks for their snake-like flexibility. This version from Kreg is a slimmer, well-made version of this specialty attachment.

90° DRIVER

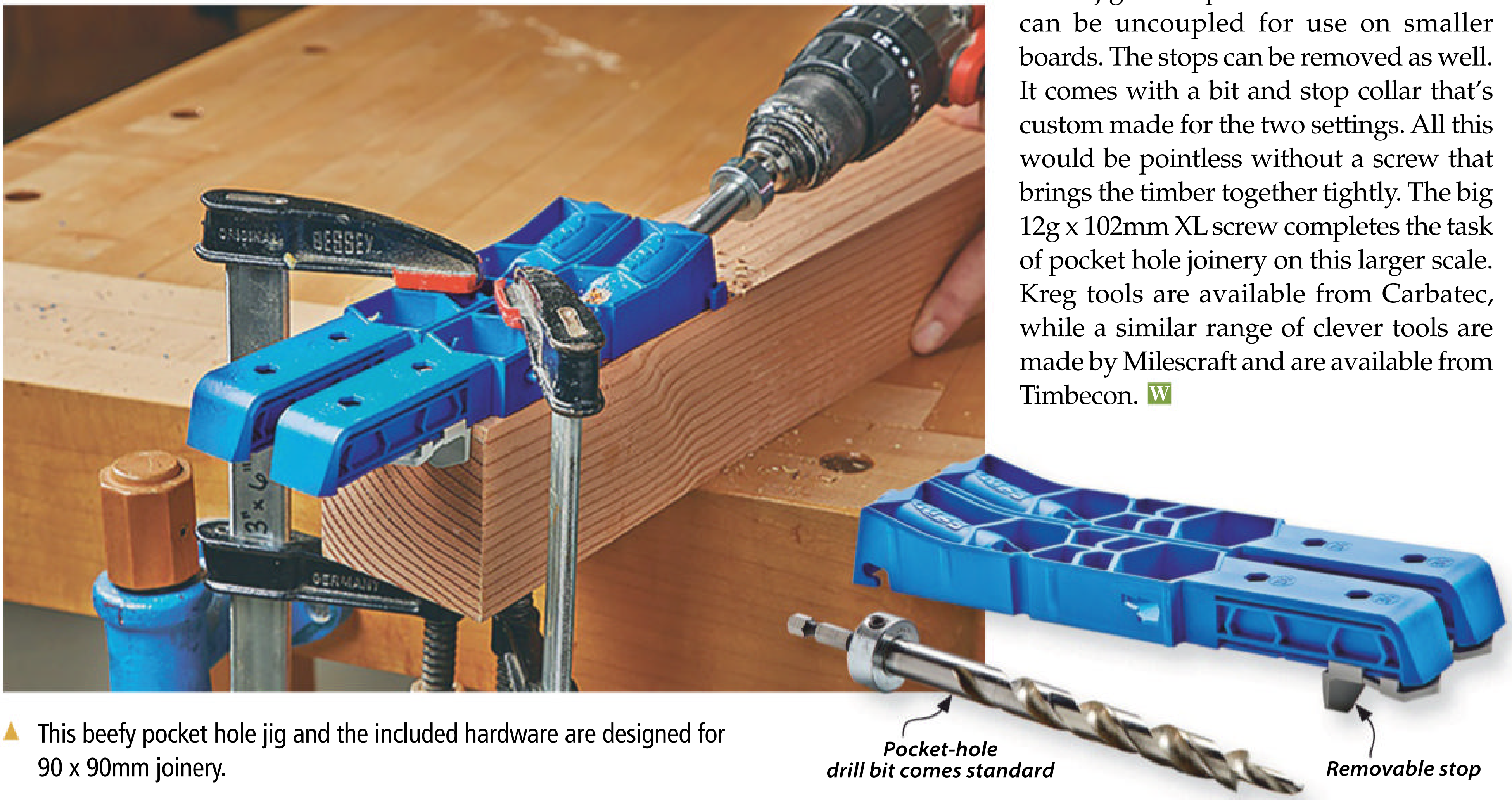
Admittedly, I don't have the need for a right-angle driver very often, so I certainly would never lay out the cash for a dedicated drill with this feature. Especially since this 90° driver attachment for your drill is so much more flexible — in operation and cost.

Installing pocket screws in tight places is a task that's been made a lot easier with the 90° Pocket Hole Driver you see above. It comes with a square drive bit that locks into the driver. You could also use this bit with any hex shanked bits.

XL POCKET HOLE JIG

The pocket hole jig you see below is designed to maximise the bond between dimensional stock up to 90mm thick. The guide holes are lined with hardened steel to guide the bit accurately. The tails of the jig adjust to drill for either 38mm to 90mm-thick boards. Grip Maxx on the underside prevents the jig from sliding around.

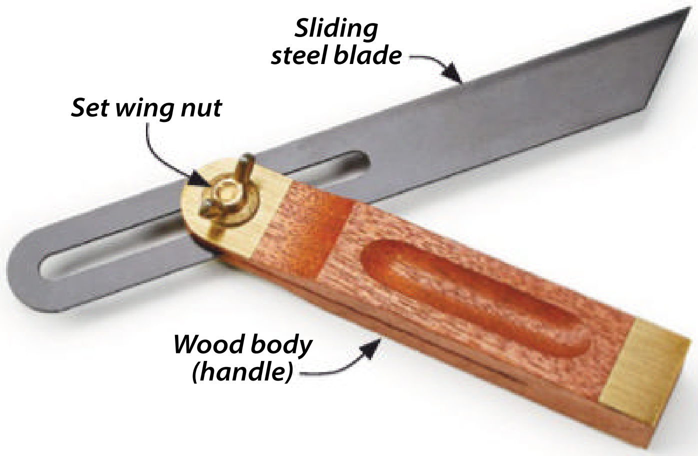
The jig is comprised of two halves that can be uncoupled for use on smaller boards. The stops can be removed as well. It comes with a bit and stop collar that's custom made for the two settings. All this would be pointless without a screw that brings the timber together tightly. The big 12g x 102mm XL screw completes the task of pocket hole joinery on this larger scale. Kreg tools are available from Carbatec, while a similar range of clever tools are made by Milescraft and are available from Timbecon. W



▲ This beefy pocket hole jig and the included hardware are designed for 90 x 90mm joinery.

Tips for Using a Bevel Gauge

Woodworking has a number of challenges. None more so than when you have to deal with angled cuts. For most of the projects I build, the workpieces come together at 90°, with an occasional 45° here and there. When I have to deal with angles other than those, I can't check them accurately with a combination square or easily set up my machinery using the adjustment options offered on the tool.



▲ A basic bevel gauge is a simple tool consisting of a body and blade with a locking mechanism.

THE SOLUTION. In most cases, you'll find that a bevel gauge is the tool of choice to solve the problem (photo at left). A bevel gauge is also referred to as a sliding T-bevel, carpenter's bevel or sliding bevel gauge. Regardless of the name, its purpose is to duplicate an angle exactly, without having to do any measurement.

A bevel gauge is a simple tool. In its basic form, it consists of a wood (or metal) body, a steel or brass blade and a wing nut (or knurled knob) to lock the two parts in place at the desired angle. You'll want to note that if a wing nut is used to lock the parts, it's important that it not extend past the body or blade where it might interfere with an accurate setting.

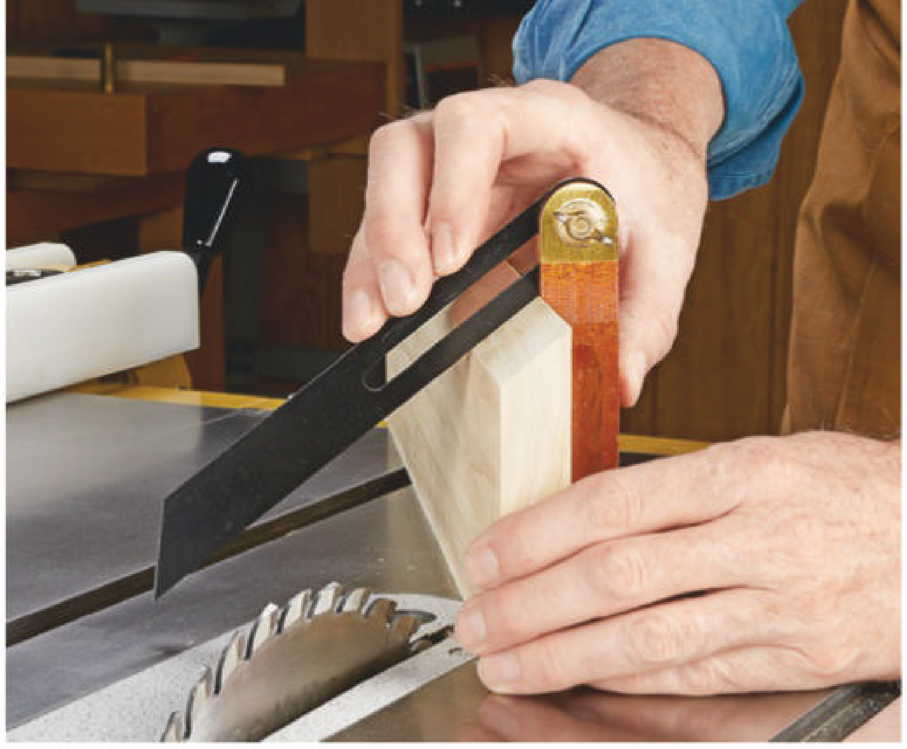
A slot in the blade allows you to adjust its position as needed during use. This blade (and the body) can vary in size. I find a 150mm blade works best for most tasks.

Chris Vesper from Vesper Tools positions his knurled locking nut at the base of the handle. This innovation allows the bevel to be used right- and left-handed.

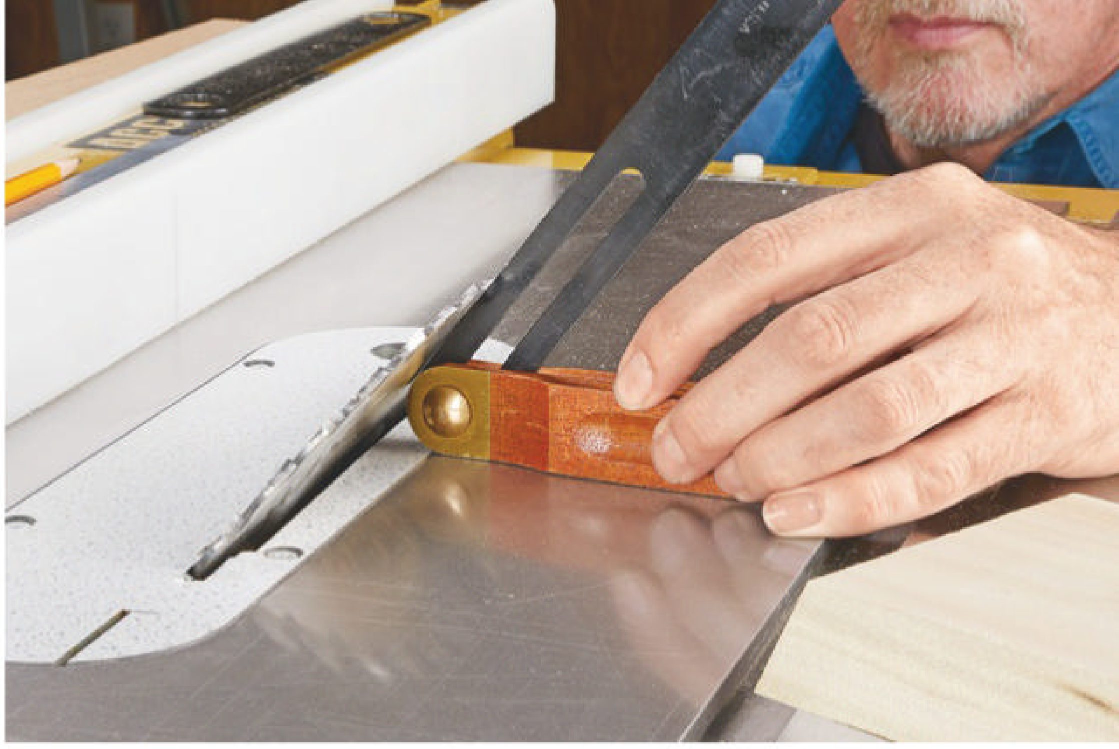
MATCHING AN EXISTING ANGLE. One of the more common uses for a bevel gauge is to duplicate an existing angle. When that's the case, simply loosen the blade of the bevel gauge and place the body against one of the surfaces of the angle you want to copy. Then it's just a matter of rotating the blade until it rests securely against the mating surface and locking it in place. From there, you can transfer that angle to another workpiece if you're doing layout work, or quickly set up a machine to make the cut, as you'll see next.

MACHINE SET-UP. Another use for a bevel gauge is tool set-up, especially if you need to adjust the tilt angle of your table saw blade. I find it's best not to rely on the angle scale on most tools. I don't find them accurate enough.

Once your bevel gauge is set, either from a workpiece (top left photo, facing page) or using one of the methods shown



▲ Don't know the existing bevel angle of a workpiece? No problem. Loosen the bevel gauge and rest the blade and body against the desired angle and then lock it in place.



▲ The next step is to set up your machine, like the table saw shown above. Rest the body of the bevel gauge on the tabletop and adjust the table saw blade to match.

▲ Sliding a bevel gauge along a hand-planed bevel makes quick work of checking the accuracy of your work.

in the box below, it's a simple matter to tilt the saw blade until it matches the angle of the bevel gauge (right photo above). For an accurate set-up, be sure the blade of the bevel gauge isn't touching any of the teeth on the saw blade.

This process works just as well for setting the angle of a mitre gauge relative to the table saw blade. Again, keep the bevel gauge blade clear of any teeth on the saw blade.

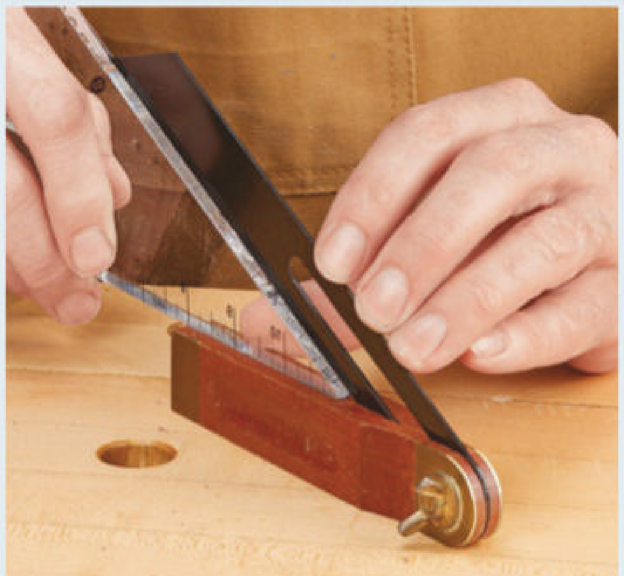
DOVETAIL LAYOUT. One of the main tasks I use my bevel gauge for is laying out dovetails. Unlike a dovetail layout gauge that's designed for one specific angle, a bevel gauge can be adjusted to suit the design needs of the project. Once you set the bevel gauge to the desired angle, you can quickly and easily transfer that angle to any workpiece, like you see in the main photo on the previous page.

HAND TOOL WORK. There are times when I like to add a chamfer or bevel to a project. For example, undercutting the edge of a tabletop to make it look a little thinner. Depending on the project, I may or may not be able to create it using one of my stationary tools.

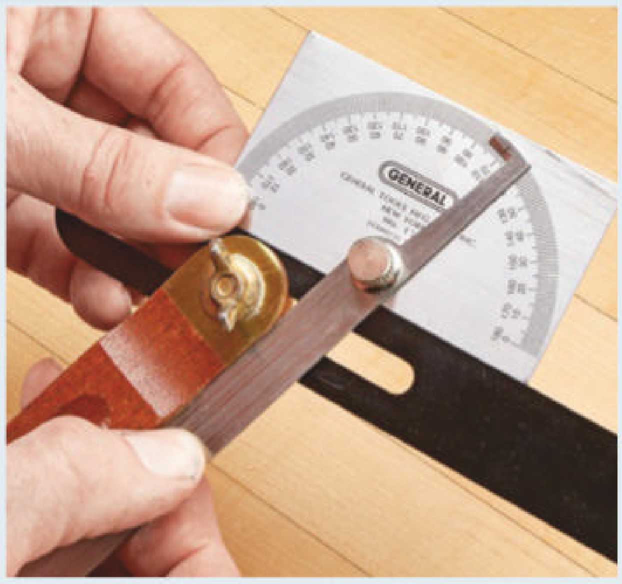
When that's the case, I'll use a hand plane to form the angle. Keeping track of where I'm at is the challenge. As you may have guessed, a bevel gauge is the solution. You can set the bevel gauge to the desired angle and make sure the angle is correct by spot checking across the edge (photo at left).

PROBLEM-SOLVER. As you can see, a bevel gauge is a handy workshop tool. It may not see daily use, but it's a must-have when the task at hand demands it. W

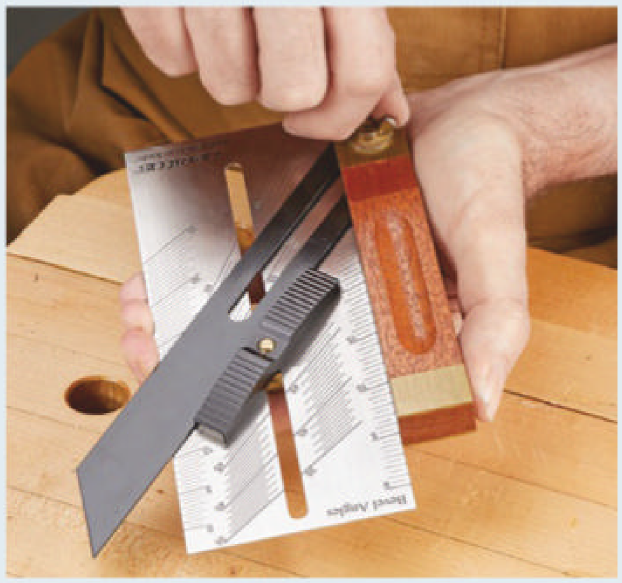
How-To: SETTING A BEVEL GAUGE



▲ A drafting triangle is an easy and accurate way to set a specific angle, such as the 30° angle shown here.

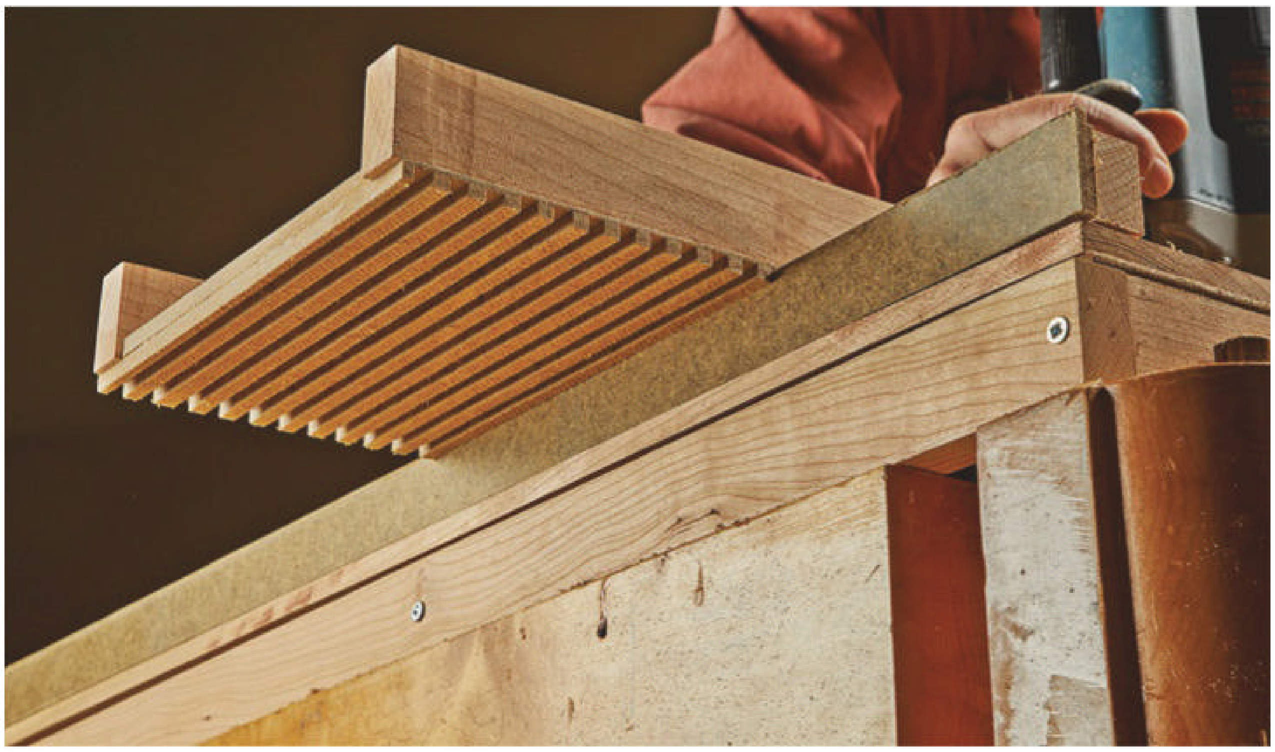


▲ A protractor is best for intermediate angles, just rest the blade against the base and lock in the setting.



▲ Commercial jigs make quick work of setting commonly used angles. The accuracy can't be beat.

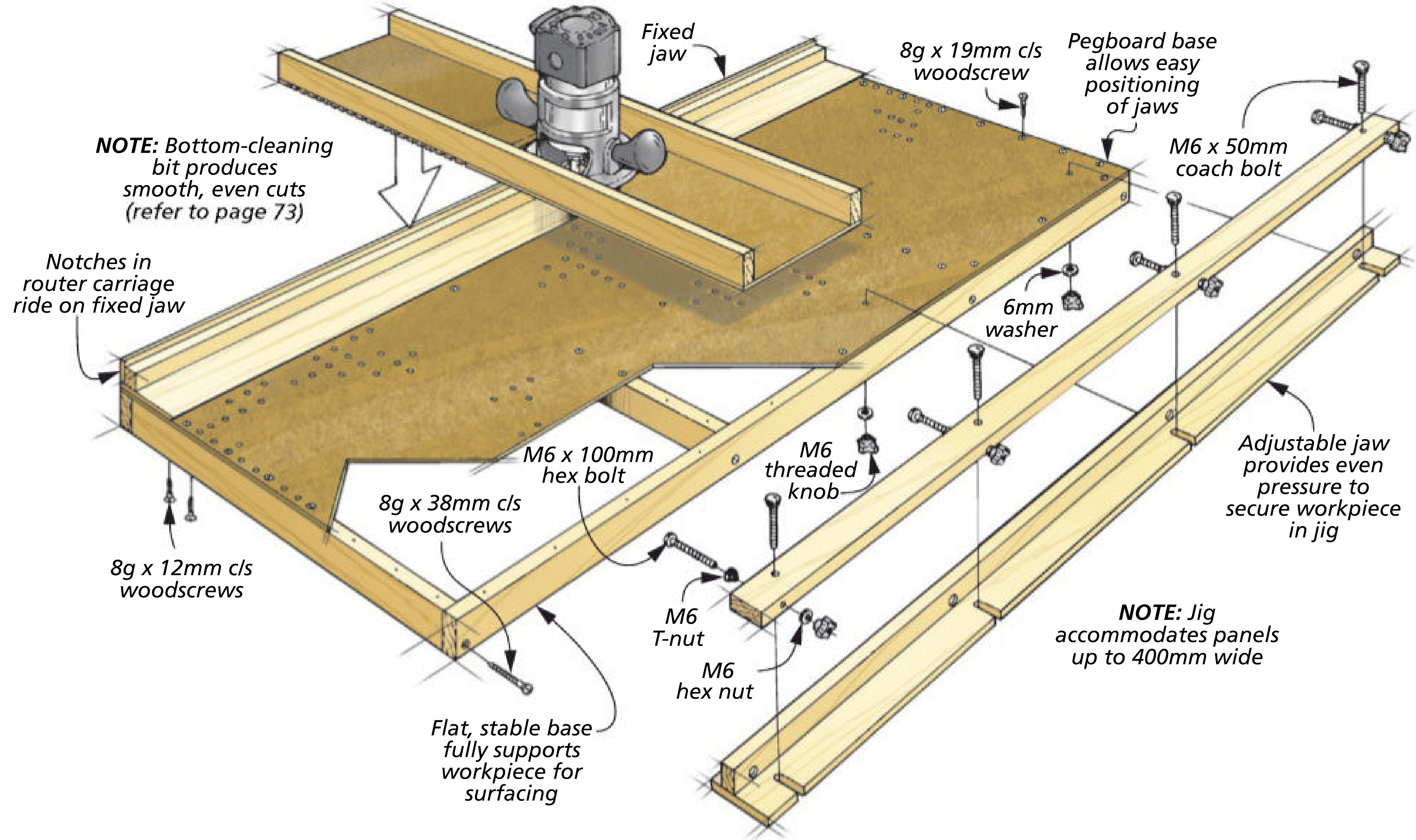
Planing Rough Stock

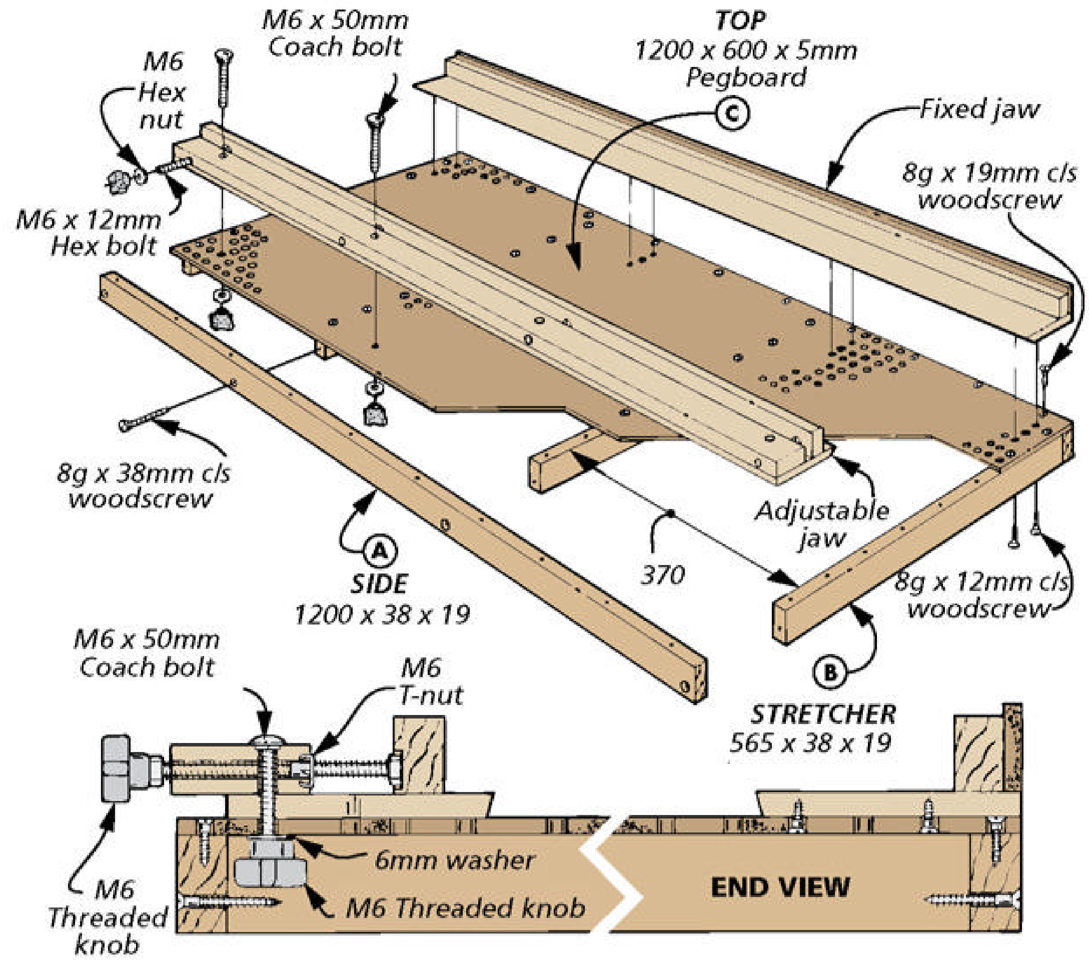


▲ Grooves in the bottom of the router carriage index on the Masonite carriage guide attached to the fixed jaw. This allows you to plane in a straight line and move across the board in even increments.

I was working on a project recently when I got the opportunity to use some air-dried timber straight from a mill. I started with a couple of 2.4m-long slabs of rough-sawn hickory, and I was excited to work with them. Air-dried timber has a rich colour, and I find it's far less prone to chipping and tearing out than kiln-dried wood. I had one issue though, and those familiar with rough-sawn timber will likely see where I'm going. I enjoy working with rough-sawn wood, but those planks will almost always dry unevenly, warping, bowing and twisting. That's what I was working with, and no planer or jointer I had around was going to be able to deal with it.

There's a common misconception that a planer will flatten stock. What a planer actually does is reduce the thickness of a workpiece, making one face parallel to the other. Naturally, this means that to get a flat workpiece, you've got to start with one flat face. And with the size of workpieces I wanted to use, the jointer wasn't going to be an option. I could've broken out the hand planes, but that would have made for one long day. Instead, I chose to tackle this problem with a router and a versatile jig. Not only did the jig save me time on this project, but it'll be great for any rough-sawn stuff I get my hands on down the road.


Fixed jaw
8g x 19mm c/s woodscrew
Pegboard base allows easy positioning of jaws
NOTE: Bottom-cleaning bit produces smooth, even cuts (refer to page 73)
M6 x 50mm coach bolt
Notches in router carriage ride on fixed jaw
6mm washer
M6 threaded knob
M6 x 100mm hex bolt
Adjustable jaw provides even pressure to secure workpiece in jig
8g x 38mm c/s woodscrews
8g x 12mm c/s woodscrews
M6 T-nut
M6 hex nut
NOTE: Jig accommodates panels up to 400mm wide
Flat, stable base fully supports workpiece for surfacing


M6 x 50mm Coach bolt
M6 Hex nut
TOP 1200 x 600 x 5mm Pegboard
C
Fixed jaw
8g x 19mm c/s woodscrew
M6 x 12mm Hex bolt
8g x 38mm c/s woodscrew
A
SIDE 1200 x 38 x 19
370
Adjustable jaw
8g x 12mm c/s woodscrew
B
STRETCHER 565 x 38 x 19
M6 x 50mm Coach bolt
M6 T-nut
6mm washer
M6 Threaded knob
M6 Threaded knob
END VIEW

Not only is this jig good for rough timber, but even glued-up panels or end grain cutting boards. After one face is flat, just flip the workpiece over and rout the board to whatever thickness you need, or stick it in the planer if it fits. The jig uses a router riding on a carriage. Grooves in the bottom of the carriage allow you to rout in even increments, sliding along a guide and a couple of rails. The workpiece rests between the rails, below the router. The router is simply moved across the piece, and because it stays at a fixed height, it removes the high spots and flattens the surface.

This jig is a great option for any woodworkers without a planer in their workshop, and it can also be used on glued-up panels and boards that are too wide for most thickness planers or jointers. The jig here works on pieces up to 400mm wide – but you could go even further by extending the width of the base and the length of the carriage.

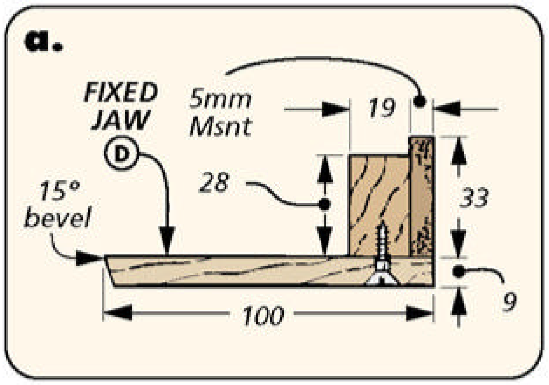
This jig is designed to handle stock up to 38mm thick, and to plane stock to as thin as 6mm using shims, as long as your plunge router reaches that far. Alternatively, by increasing the width of the rails and carriage guide, the jig could be used to plane down even thicker pieces.

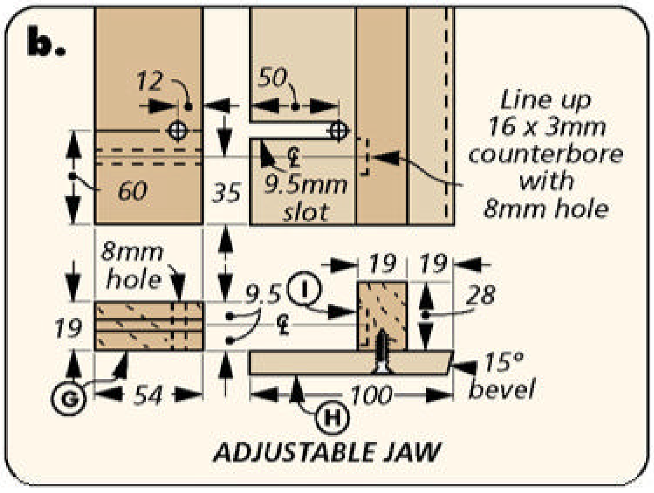
MAKING THE JIG

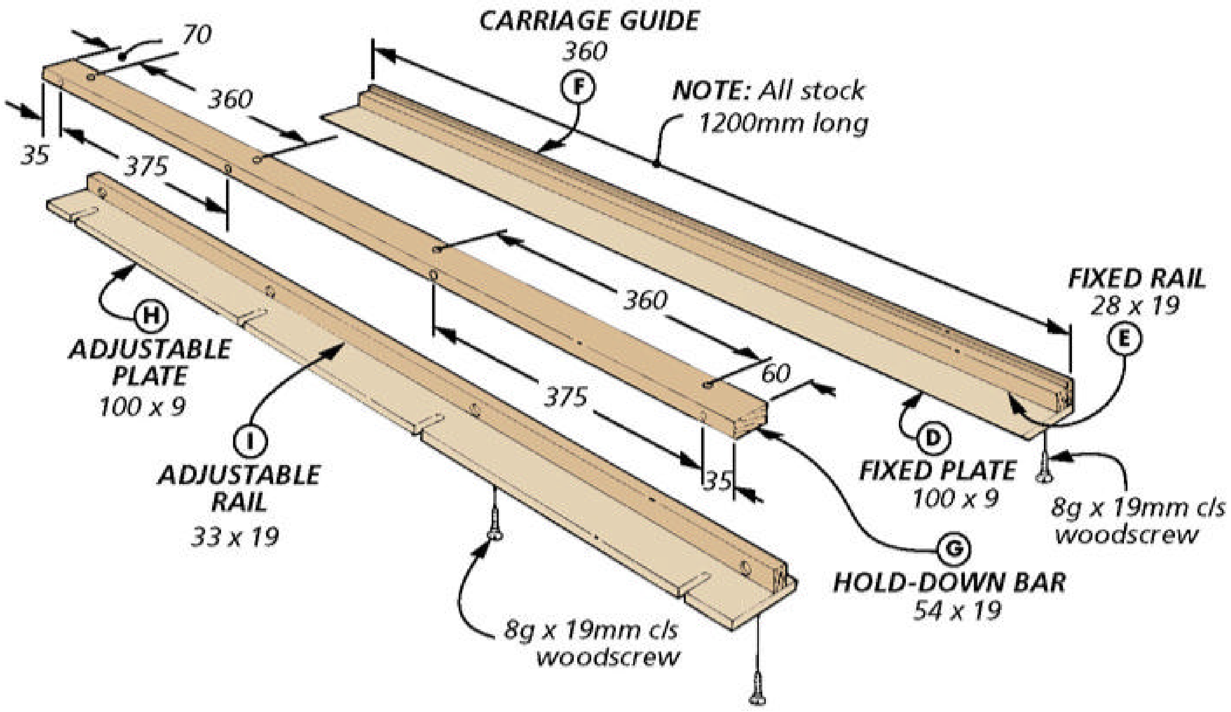
The base of the jig is just a hardwood frame consisting of two sides screwed to four stretchers (drawing above). For the surface, I used 5mm pegboard. This lets me adjust the position of the jaws for narrower pieces. Instead of drilling extra holes to attach the pegboard, I cut the pegboard so the existing holes were centred over the frame.

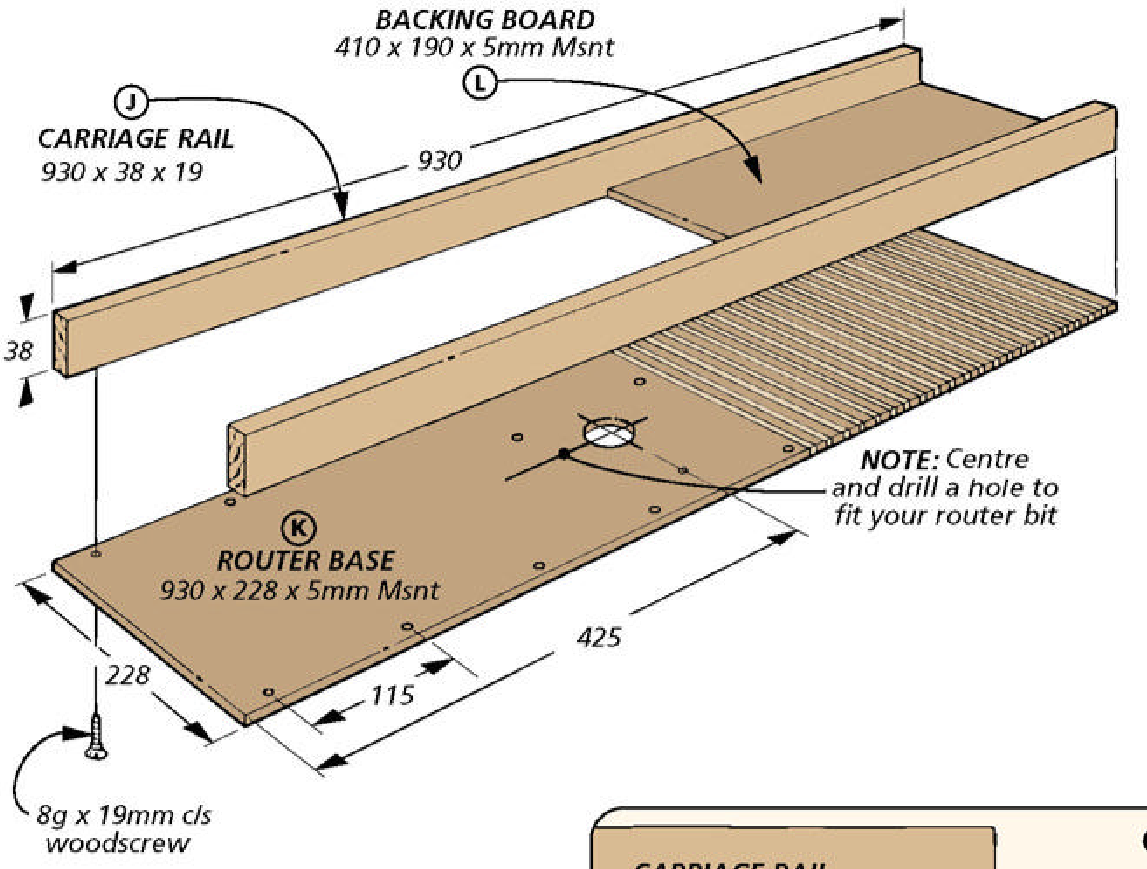
JAWS. Next up is the fixed jaw. As you can see below, there are three parts: a plate, a rail and a carriage guide.

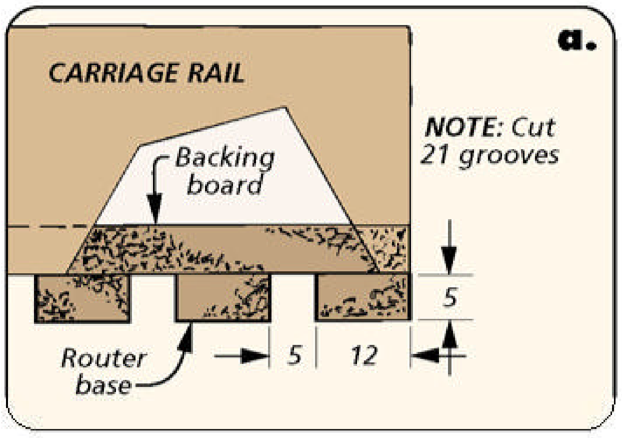
The plate is bevelled (detail 'a,' below) for a better grip. The rail is screwed to the plate to form an L-shaped support for the


a.
FIXED JAW
D
5mm Msnt
19
28
33
15° bevel
100
9


b.
12
50
60
35
9.5mm slot
Line up 16 x 3mm counterbore with 8mm hole
8mm hole
19
19
19
9.5
I
28
G
54
100
H
15° bevel
ADJUSTABLE JAW


70
360
35
375
CARRIAGE GUIDE 360
F
NOTE: All stock 1200mm long
360
60
375
35
FIXED RAIL 28 x 19
E
H
ADJUSTABLE PLATE 100 x 9
I
ADJUSTABLE RAIL 33 x 19
D
FIXED PLATE 100 x 9
8g x 19mm c/s woodscrew
G
HOLD-DOWN BAR 54 x 19
8g x 19mm c/s woodscrew





carriage. Lastly, the carriage guide is made from 5mm Masonite and glued to the rail. Once the fixed jaw is made, mount it to the base.

The adjustable jaw has three parts as well, but there are a few differences at play. First, the plate on the adjustable jaw isn't screwed to the base. Instead, it's held by a hold-down bar, allowing the adjustable jaw to move and press against the workpiece.

The hold-down bar sits atop the adjustable plate. Bolts pass down through it and into the pegboard. Again, when making the hold-down bar and adjustable rail, align the holes and slots respectively with the holes of the pegboard. Plastic knobs or wing nuts easily secure the bar and plate to the base.

To allow more minor adjustments to the plate, a second set of longer bolts runs horizontally through the hold-down bar and a T-nut, pressing against the back face of the adjustable rail. Counterbores in the adjustable rail accept the heads of the bolts, keeping the jaw from sliding when pressure is applied (detail 'b,' opposite page). The pressure comes from threaded knobs and jam nuts threaded onto the end of each bolt. Once complete, attach the adjustable jaw to the base as well.

CARRIAGE. The carriage shown in the drawing above supports the router above the workpiece as it rides across the jaws. It consists of its own pair of rails with a base for the router. Grooves in the bottom allow you to index the router above the workpiece in even increments as you plane.

Let's start on the rails. These pieces are cut extra long so the carriage spans both jaws no matter where it's indexed. The rails are glued and screwed to a router base made of 5mm Masonite. Don't screw into the section of the base that will be grooved.

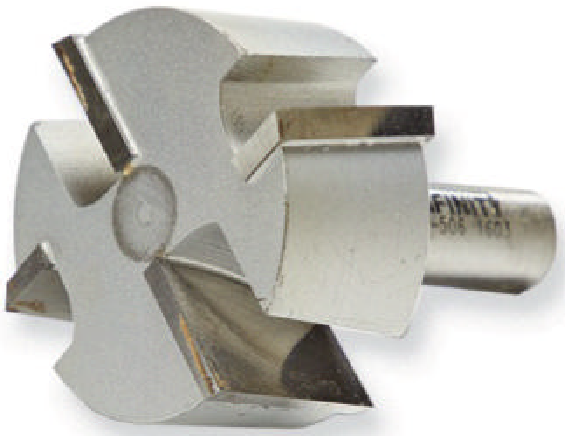
To support the grooves, a backing board is cut to fit between the rails and glued to the top of the base. Once the glue dries, the indexing grooves can be made. These are cut on the bottom of the base and sized to fit the thickness of the carriage guide, as shown in detail 'a' on the previous page and in the drawing above. I spaced the grooves 12mm apart from each other, but at a minimum the space between them should be 6mm less than your bit diameter to allow for an overlap on each pass. After the grooves are in, cut a hole in the base for your chosen bit and mount your router to the carriage.

MILLING YOUR OWN TIMBER

Milling your own timber with a Lucas Mill or similar milling system allows you to slab a log and then stack the sections so they can dry in the shade. Typically a thumb thickness of hardwood timber will take 3 months to air dry. That means a slab two thumbs thick will take 6 months to season to EMC. You can see why timber companies prefer to kiln season timber in a couple of days rather than wait for air drying to do its job. Besides saving money and recycling that tree that needs to be removed from the backyard, milling your own slabs allows you to make the most of the grain patterns.

The fabulous Bahut cabinet on page 44 could be made from slabbed timber milled to 30mm thickness, let season, then milled with the planing jig and a spoilboard bit to 25mm thickness.

George Nakashima was a Japanese American craftsman who introduced the Bahut cabinet to a wider audience. The respectful use of every part of a tree runs deep in the craft culture of Japan. Book matching grain and inserting butterfly keys to lock cracks together became a hallmark of Mr Nakashima. Seeing beauty in knurled and twisted grain that has been saved from the furnace warms the soul.



Spoilboard bits are designed to leave a smooth, flat surface, and they make planing a wide piece quick work. You can find our source for this bit on page 73.

PLANING WITH A ROUTER

Now that the jig is built, it's time to dive into how to use it. Planing a workpiece is fairly straightforward, as most of the work goes into the set-up. Once that's done, it's all a matter of learning the routing technique and getting to work.

THE BIT. Before we get too far, I should talk about which bit you'll want to use. This jig works well enough with a straight bit, but after using it the first couple of times, I was a little disappointed with the results. When I was done, a series of swirls had been left on the workpiece. I could've sanded or scraped the surface clean, but I figured there had to be a better way.

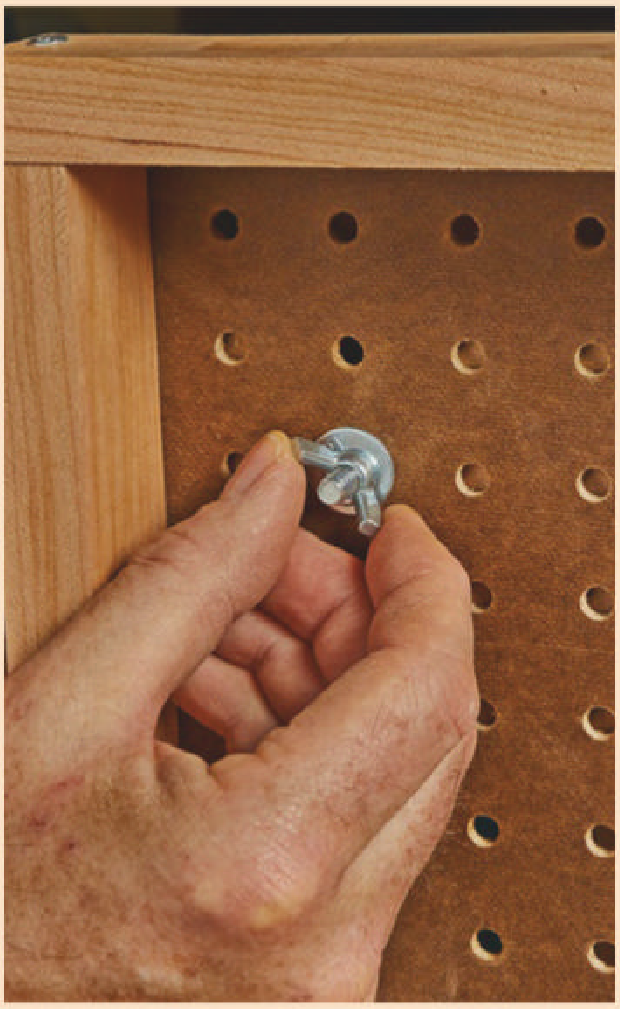
The issue here was the straight bit I used. Specifically, the points on the bottom of the cutters. After a little reading, I found that a bottom-cleaning bit might be the answer to my problems. It operates much like a straight bit, but it has an additional set of cutters on the bottom to "plane" the surface smooth and flat. This left me with a surface that barely needed to be smoothed or sanded.

And I was almost satisfied with just that. Luckily, I have coworkers. I was using a 25.4mm bottom-cleaning bit when I was introduced to the bit you see at the left: a spoilboard bit. This bit had a lot in common with my bottom-cleaning bit, and as it turns out, it's typically used to flatten the spoilboard of a CNC machine. The big advantage here is that the one pictured (and the one I now prefer for this jig) has a 50mm diameter. As a result, this bit cut my work time in half. Now I can plane down a workpiece with this jig in minutes.

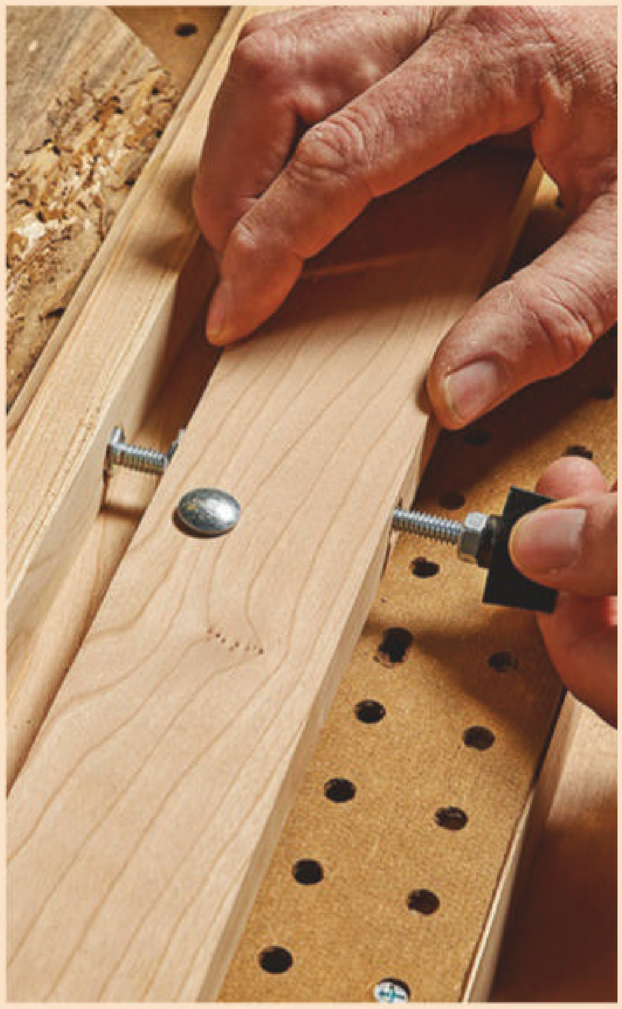
USING THE JIG. No matter which bit you've decided to use, the technique is the same, as you can see in the box below.

First, secure the workpiece in the jig. Position the adjustable jaw on the platform. This is more of a broad-stroke positioning, so locate it as close to the workpiece as you can now, but leave the hold-down bar a little loose. Now use the

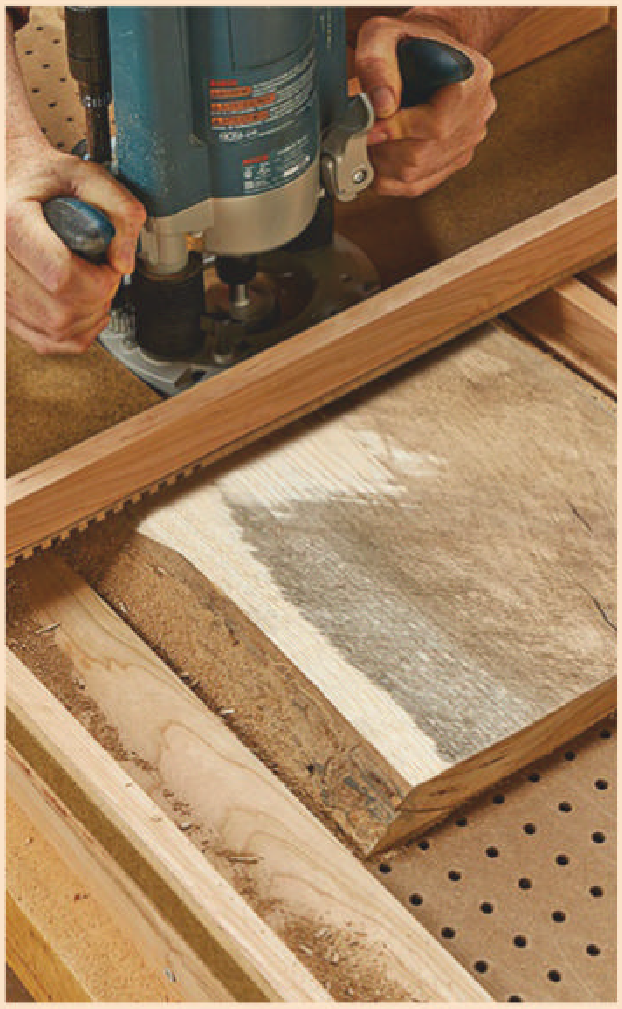
USING THE JIG



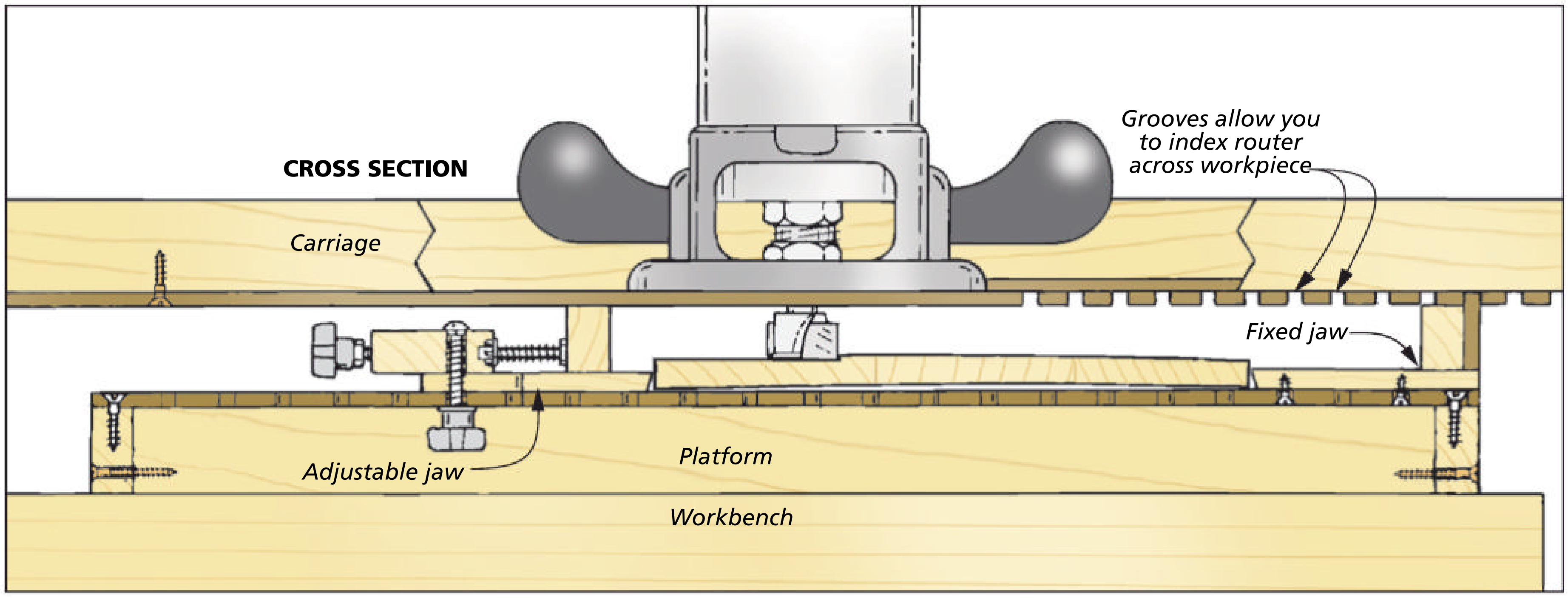
Position the Jaw. Begin by positioning the adjustable jaw assembly as close to the workpiece as possible.



Secure the Workpiece. Tighten the hex nuts until the adjustable plate firmly grips the workpiece.



Flatten Away. Index the carriage and run the router across the workpiece to plane. Then re-index and rout again.



knobs to tighten the hex bolts, moving the adjustable rail and plate. When the adjustable plate is firm against the workpiece, tighten the hold-down bar fully to lock it in place. For heavier workpieces, you'll want to have the jig hanging over the edge of your bench while you get the adjustable jaw assembly in place.

When you place the workpiece in the jig, pay attention to the initial shape. Is it cupped, or is it twisted? If you're surfacing a twisted piece, you can put either side up first, so long as you make sure to remove all the high spots before flipping it. When working on a cupped piece, start with the concave side facing down (as shown in the drawing above) to prevent the workpiece from rocking.

If the jig does end up rocking, you may notice that one stretch has a slightly different depth than the one beside it after you've routed, leaving a ridge. You may need to shim up the areas not touching the platform to stop if from moving.

If you keep finding a ridge, check under the hold-down bar to make sure it locks in place. A lot of material gets removed with this jig, so sawdust will eventually end up everywhere.

If you're surfacing a warped board instead of a rough one, keeping track of progress during your planing can be difficult without some kind of reference. Covering the surface with pencil marks is an easy way to do this, planing until they're gone.

While you rout, try to apply a steady amount of force throughout, and keep the force consistent between passes. Several passes may be needed to flatten the surface. This is easy to do with most plunge routers by simply adjusting the turret on the depth stop. I like to limit the depth of the cut to around 3mm per pass to prevent tearout and keep the stress on my router motor to a minimum, especially with a larger bit like I was using.

THE OTHER SIDE. Once you've flattened one side, you can run the opposite face through the planer, so long as your planer is wide enough. As I mentioned earlier, since you're starting with one flat face, this will leave you with a flat, parallel-faced workpiece. If you chose to stick with a standard straight bit, you can run the routed face through afterwards to remove the router marks. The marks will be small enough that it won't make a difference when planing the workpiece down to thickness.

Alternatively, this jig can be used to bring a workpiece to thickness in place of a planer. In this case, all you need to do once you've surfaced one side of your piece is flip it over and surface the opposite side.

IN PLACE OF A PLANER. This jig has become my go-to for planing rough-sawn timber. For anyone who has yet to buy a planer, or who's looking to work with pieces too wide for the one they have now, this jig is an excellent choice. Keep in mind, you can also build the jig longer or wider than the dimensions shown here to accommodate larger pieces, and because the jaws can be easily removed, multiple sets of jaws can be made to handle a wide range of thicknesses. So whether you're working with a cupped panel or some rough-sawn timber, this jig is bound to be handy. W

WANE EDGE

In nature you seldom see a square or a rectangle, however our homes and workplaces are full of rectilinear shapes and sharp edges. The timber we buy comes to us dressed-all-round and just seems to beg to be assembled into furniture with square edges.

A wane edge is the natural edge left when a board is milled from a log. In the mill it will be trimmed square. If you are milling your own timber and then planing it smooth with a router jig you have the option of leaving the wane edge intact. Tables with wane edges look more natural than a sheet product, as do countertops.

If you take a look at the slab being planed on page 24 you can see it could work as a bench seat, or ripped, resin-filled and then used as a table top. A wane edge can enhance a piece of furniture.

Hand Plane Restoration

Hand planes have an ancient history. The oldest hand plane on record was recovered from Pompeii, coated in volcanic ash and a little under 2,000 years old. While I've never come across one quite that old myself, it's not uncommon to find planes that were produced almost a century ago, if not even earlier. And many of them show it.

I've always been impressed by restoration projects, whether it's cars, houses, tractors or hand planes. In the last couple of years, I've come by a few fixer-upper planes at bargain prices. I've found that restoring them to their former glory can be a great workshop project. This restoration project is on a Stanley No. 26 plane, with a beat-up wood body, plenty of rusty castings, a broken horn on its handle and a chipped out mouth. There's plenty to be done.

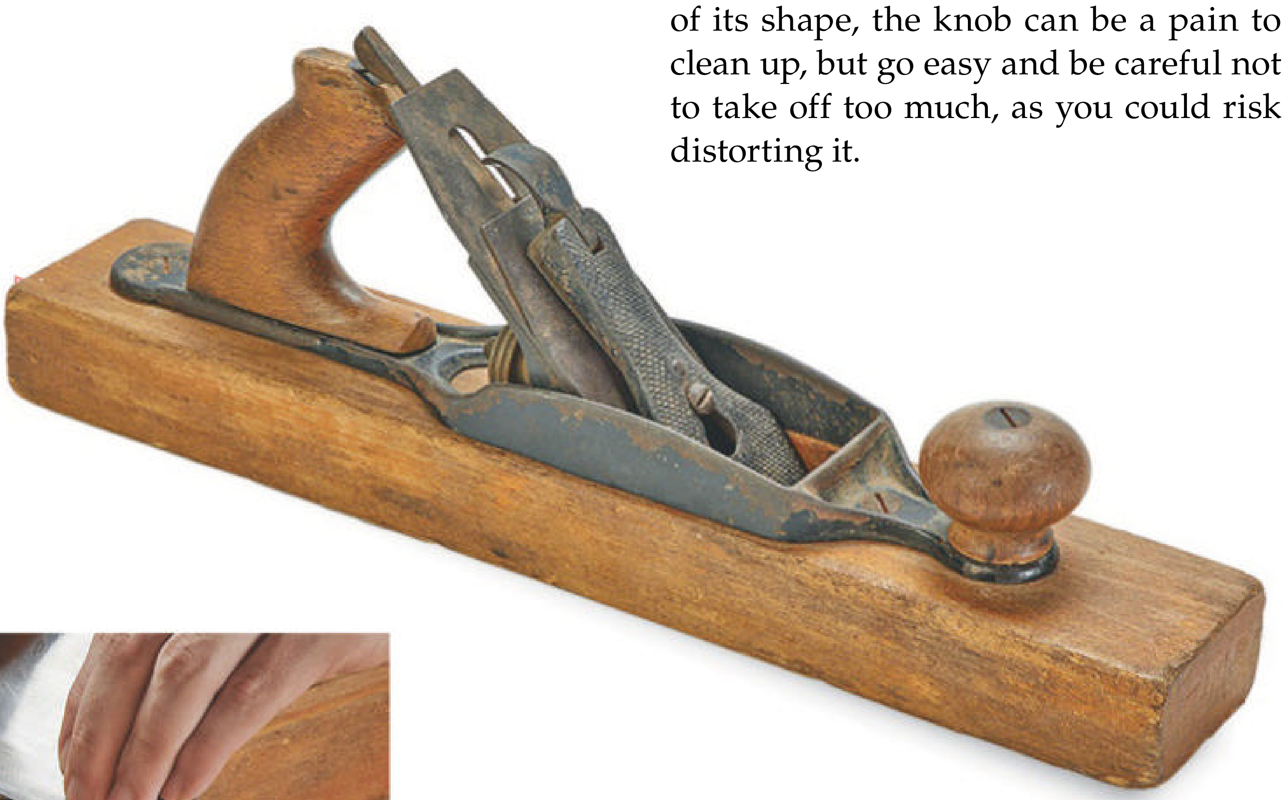
FIXING UP THE BODY

To begin, I disassembled the plane, removing the handle, the knob and the castings. I chose to start by cleaning up the body of the plane, as you can see in Photo 1 below.

I sanded and scraped to bring out the bare wood of the body, then cleared out the throat with a sanding stick (Photo 2). Avoid the sole though, as we'll take care of that at the jointer.

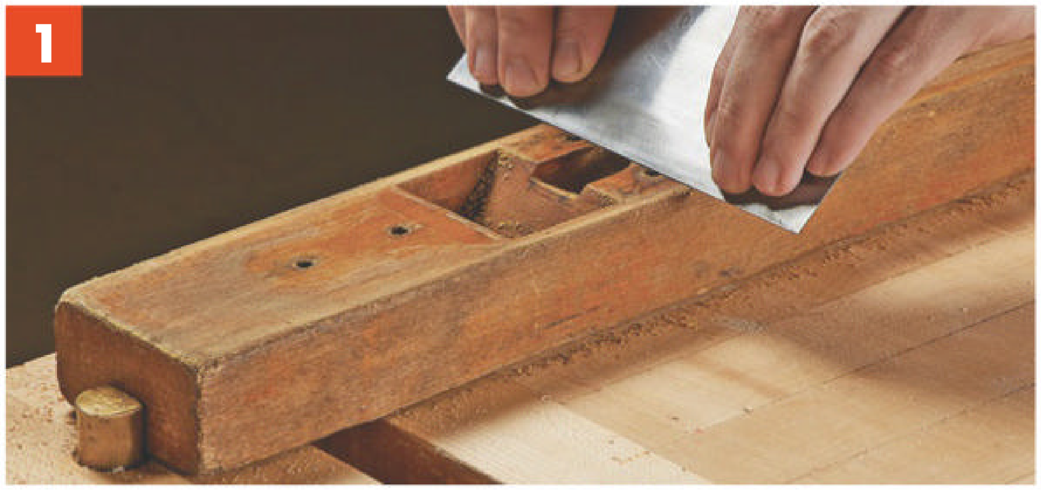
The jointer is the surest way to get a flat sole. However, if you plan on tightening up the mouth (like I needed to), hold off until the patch is in place.

This is also a good opportunity to scrape and sand the knob, as it's mostly the same work as with the body. Because of its shape, the knob can be a pain to clean up, but go easy and be careful not to take off too much, as you could risk distorting it.



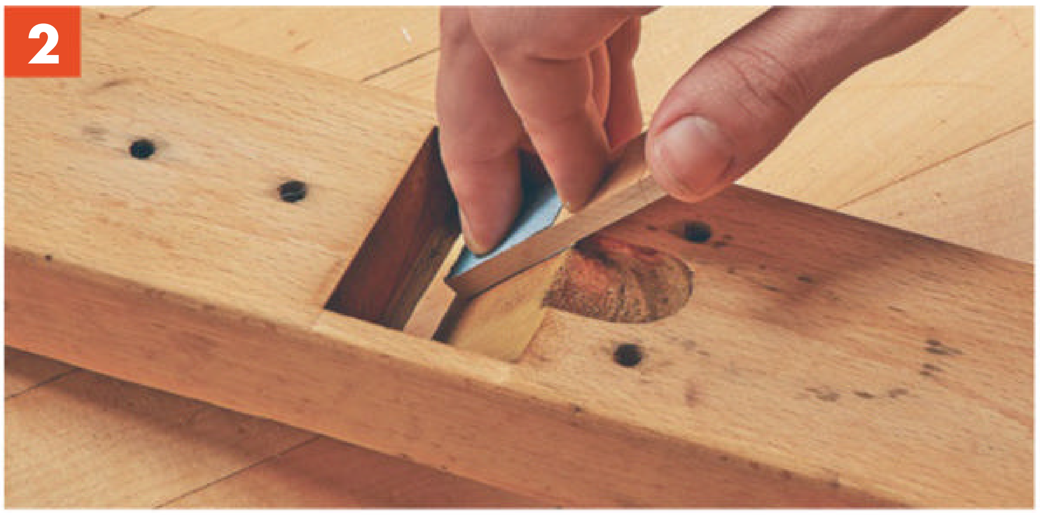
▲ My plane of choice on this restoration project was a Stanley No. 26 transitional jack plane. While these were produced from 1869 to 1942, this plane is likely a newer model, probably made after 1933.

1



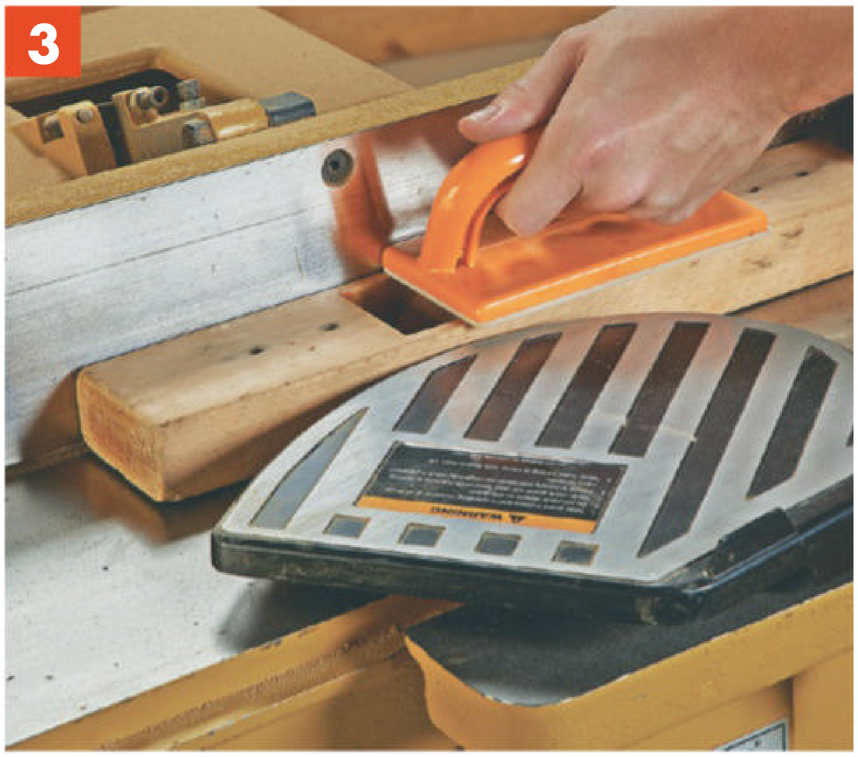
▲ To clean off the dirt, grime and what remained of the old finish, I started with a card scraper. Once I had gotten a good deal off, I sanded with 150- and 220-grit sandpaper to bring the body down to smooth, bare wood.

2

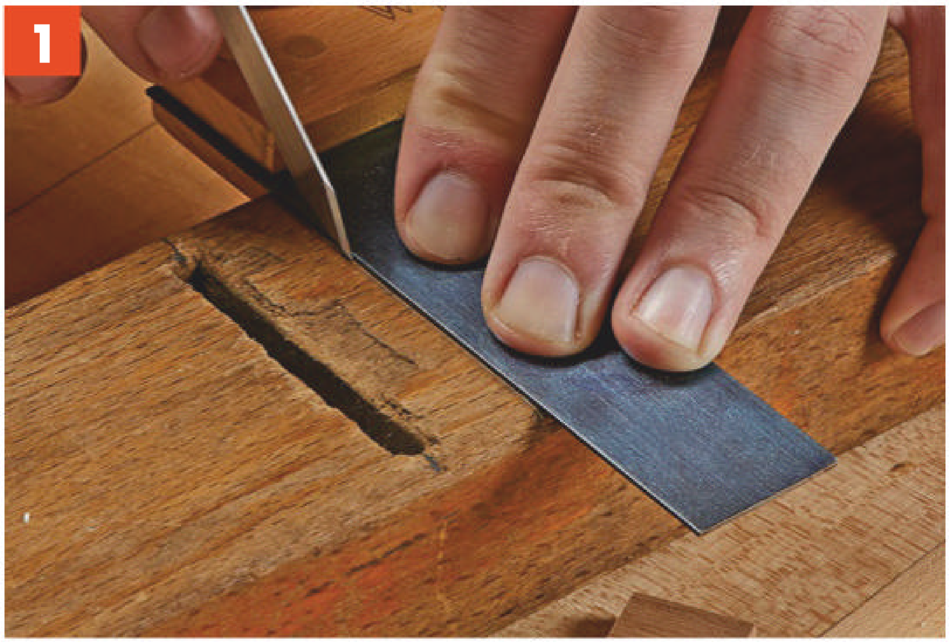


▲ The throat can be a hard place to sand, so I made a sanding stick with a scrap piece and some adhesive sandpaper. Sand until the bare wood is exposed.

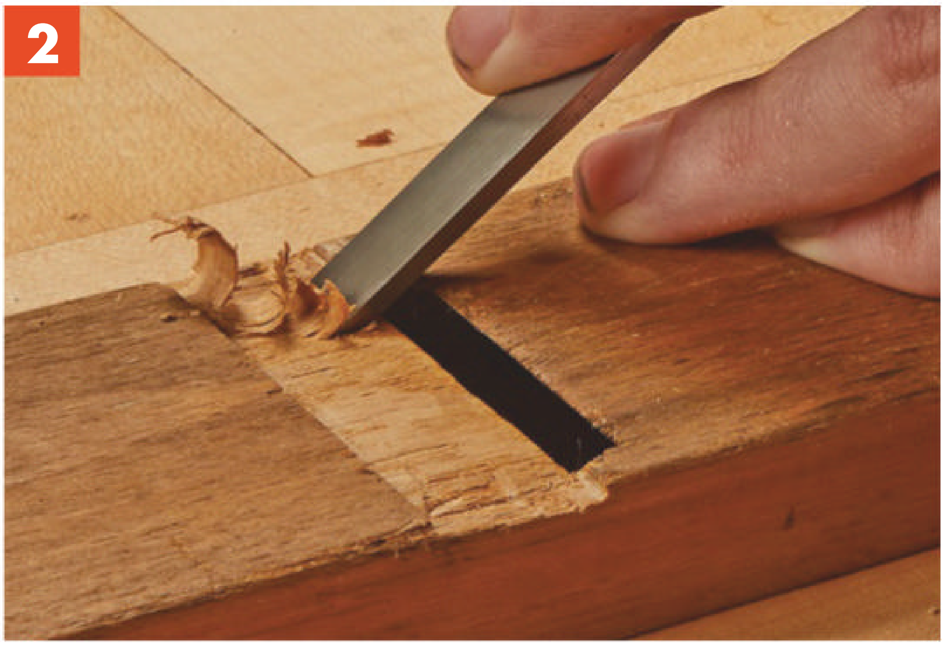
3



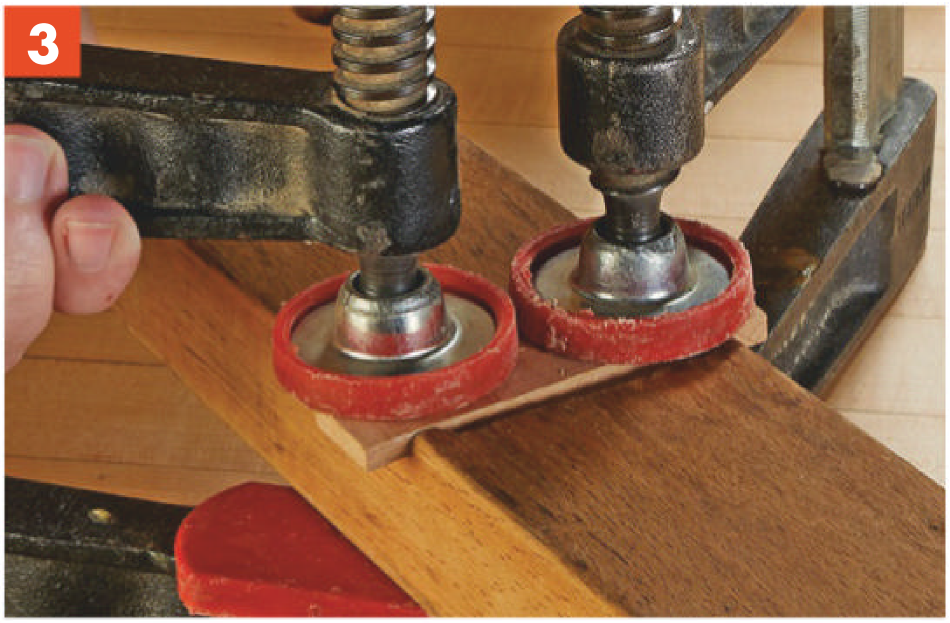
▲ Don't sand or scrape the sole of the plane. The sole needs to be flat, and there's nothing in the workshop that I trust for that task as much as the jointer.



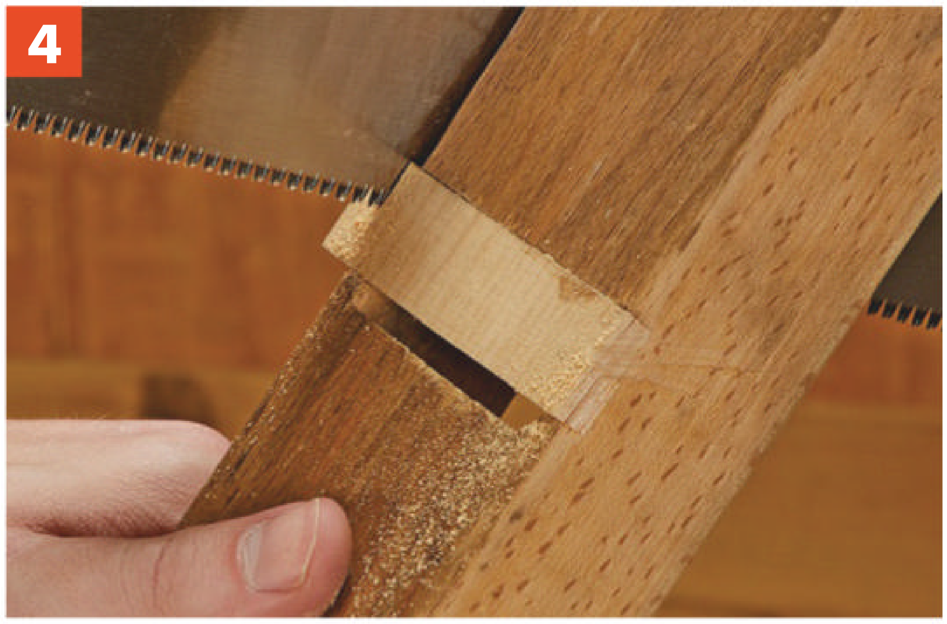
Begin by scribing out the location of the insert on the sole of the plane. Consider here how wide the mouth of your plane needs to be. For my jack plane, I only wanted to close it a little.



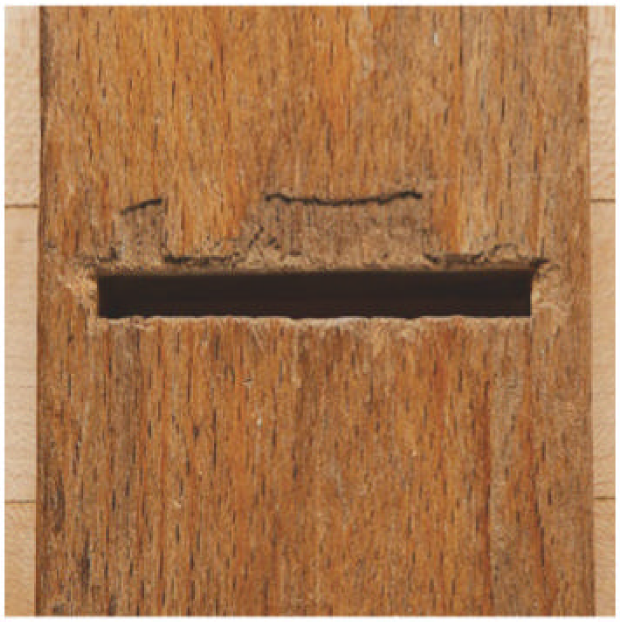
When removing the waste for the throat insert, I prefer a chisel, registering the tip in the mark I scribed. This could also be done on the table saw, just be sure to back up the cut to prevent chipout.



Glue your insert in place, providing equal clamping pressure on both sides. The fit on this piece needs to be as tight as possible, so don't be afraid to mallet it in and sink those clamps down.



After the insert has dried, saw the ends flush. Although you'll be running it through the jointer, you'll still want to sand down the insert to the same height as the sole.



The mouth of my plane didn't have the prettiest smile. Two big chunks had been chipped out of it long ago, leaving a wide gap that had to be closed.

MAKING A THROAT INSERT

As you can see at left, the mouth of my plane needed a little love. While a jack plane doesn't need the tightest throat in the world, I did want to shore up those gaps before using the plane again.

I started by looking for a piece of wood to match my plane. Since the body of this Stanley is beech, that would be ideal, but alder or birch would work as well. I ended up going with birch, as it would stand up against wear better than alder.

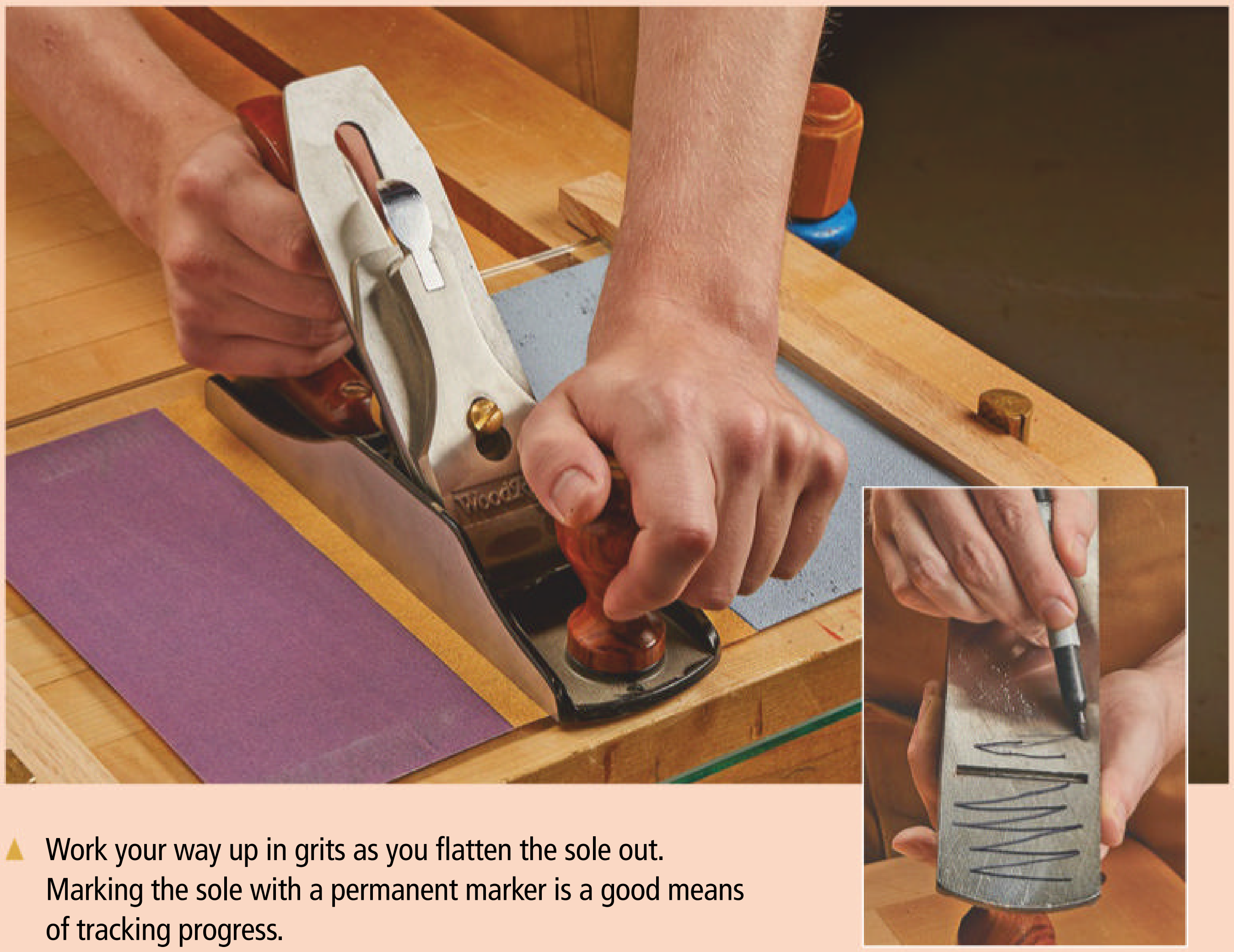
The photos above illustrate the process of making a throat insert. First, lay out the size and location of your insert. You have plenty of options here, but the biggest consideration is how tight the throat should be. Since I'm using a jack plane, I really just wanted to fix the chips. If I was fixing up a smoothing plane, I'd pull it in much tighter.

As shown in Photo 1 above, I used a marking knife to lay out my insert. This isn't necessary, but I did it because I wanted to take out the waste with a chisel to ensure a tight fit (Photo 2). The other option for removing this waste is to cut it like a trench on the table saw. This can save you some chiselling time, but even then I recommend removing the middle with the table saw and saving the edges for a chisel. The fit needs to be snug, and it's best to sneak up on the final size.

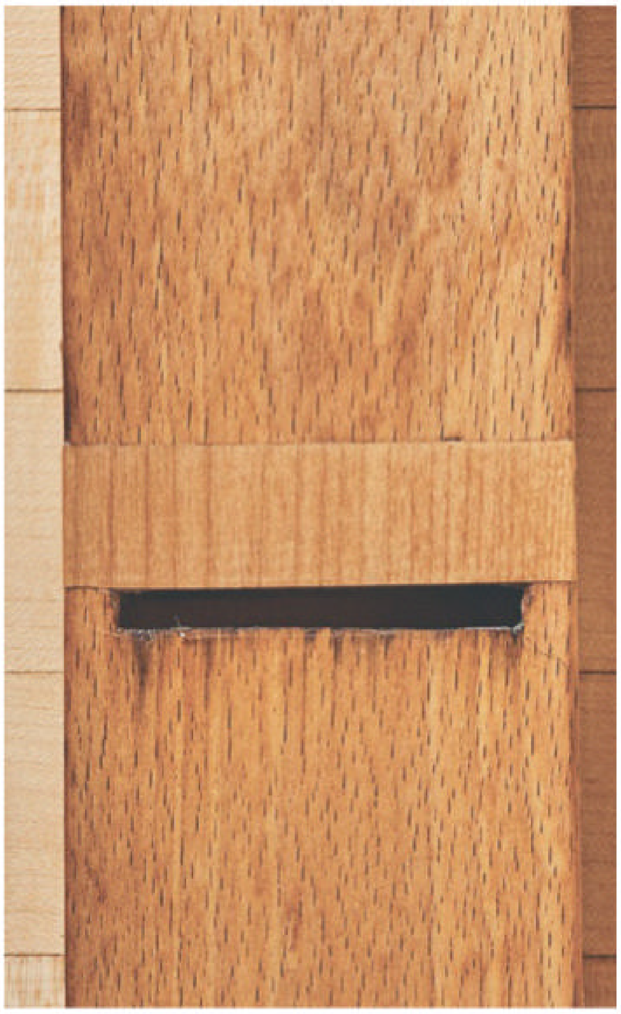
Once the insert fits, glue and clamp the pieces, then clean up the squeezeout (Photo 3).

FLATTENING OUT A METAL SOLE

Truing a Metal Plane. Flattening a metal sole requires some special consideration. You'll need to do so with the plane assembled (just be sure to back the blade off), as the tension of the lever cap can flex the metal sole. A lapping station like you see at right is ideal. The one I used was merely a piece of plate glass with adhesive sandpaper attached to it. You'll need three patches of sandpaper: one around 100, one around 150 and one around 220. Start with the coarse paper, making a few passes and checking the progress on the sole. It can be difficult to follow the progress on a metal plane, but a few lines drawn with permanent marker can be a good guide. Work through the grits, going from coarse to fine, to remove the high spots and take out the striations that form.



▲ Work your way up in grits as you flatten the sole out. Marking the sole with a permanent marker is a good means of tracking progress.



▲ After jointing the sole and finishing the plane, I was pleased with how the insert turned out. Despite the visual difference in grains, the seam between them is as smooth as any glued-up panel.

After the glue has dried, clamp the plane body in a vice and use a handsaw to cut the insert down to width (as in Photo 4). As I mentioned on the previous page, it's best to joint the sole of a wooden plane flat, but I sanded the insert flush first to make sure it wouldn't catch on its way through.

Once the insert is sanded down, take the sole for a pass on the jointer (shown in Photo 3 on page 31). You should be left with a smooth seam and a clean, bare sole.

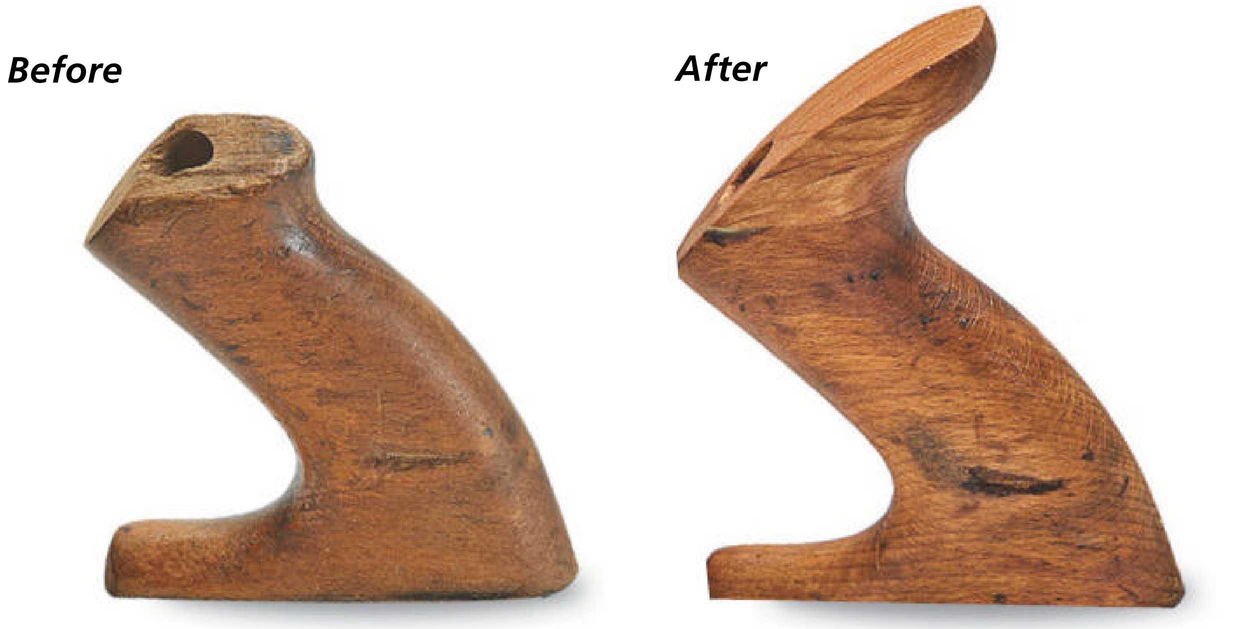
TRANSITION PLANES

Leonard Bailey patented the modern all-metal plane way back in the 1860s. Before the development of the Bailey patent plane, all planes had wooden bodies with throats cut to accommodate the blade. The stability of a cast iron body allowed Leonard to develop the adjustor that started a revolution in plane design.

Transition planes are planes that incorporate the advantage of a metal adjustor and the familiarity of a wooden sole. One advantage of a transition plane is that you could build different length soles out of the timber of your choice. You could then take your jack plane apart and use the mechanism to make a fore plane with a longer sole.

Wooden bodied planes still rule the roost in Japan. Wooden planes have many advantages over their more "modern" cast iron rivals. They have fewer moving parts and have bodies that don't rust. The wooden bodies are warm to touch and seem to have a "soul".

Arguably the best planes in the world are made here in Australia by Terry Gordon. Terry uses amazingly hard Australian timbers and a Morris-style adjustor to craft his highly acclaimed works of wonder.



My task for the tote was not only to clean up and refinish the body, but also to make a patch to repair the broken horn.

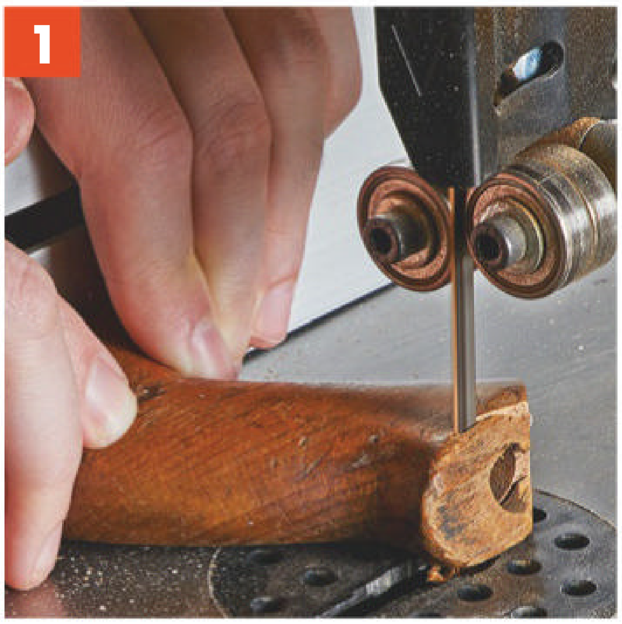
HANDLE REPAIR

The big issue on the handle, as you can see at left was the horn. It'd been broken off and worn down, and it wasn't a clean break either.

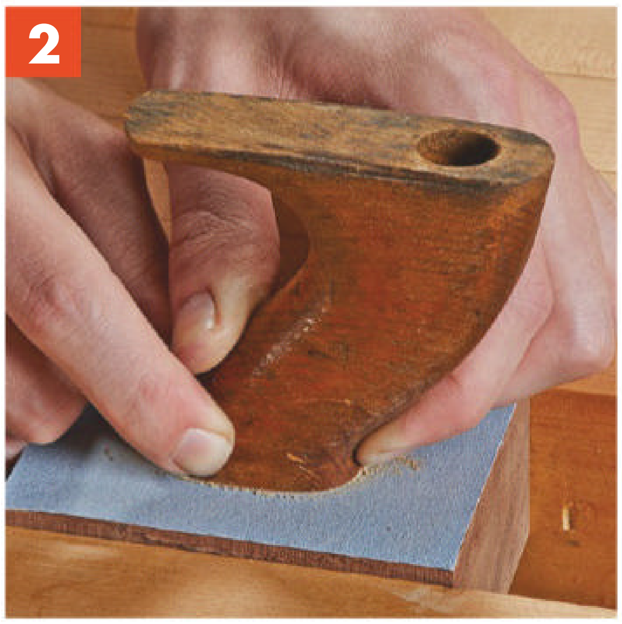
I began by flattening the break at the bandsaw (Photo 1). I used the fence to try and get as close to parallel to the bottom of the handle as possible. Then I clamped up a sanding block to make sure the break was sanded flat (Photo 2). Be careful not to let the handle rock as you sand or you'll end up with rounded edges that won't line up.

If your replacement is going to cover up part of the screw hole, measure the hole. You'll need to drill this out later.

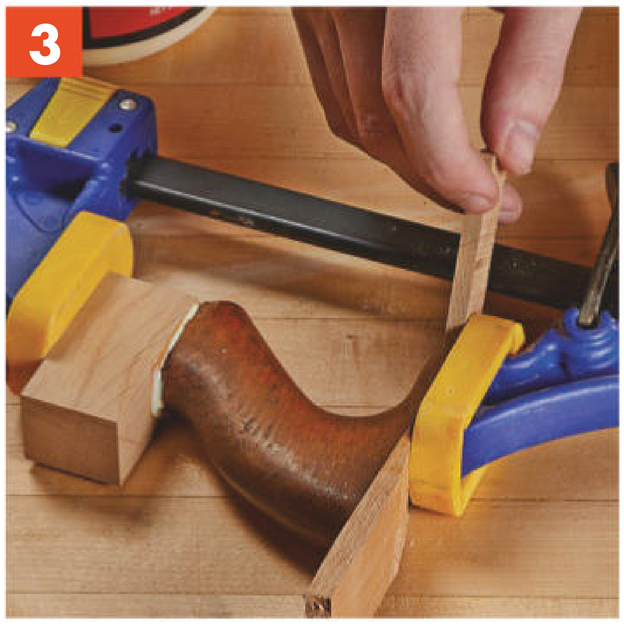
Then I went back to that scrap of birch and got myself another little chunk. As



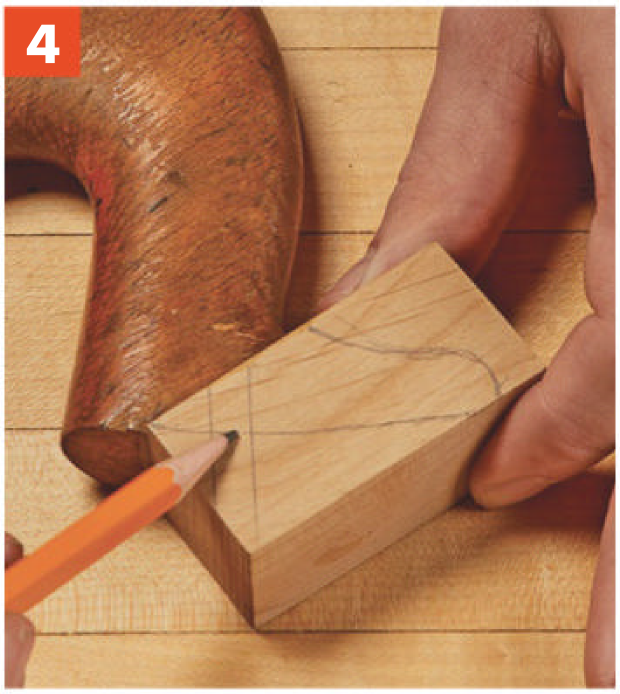
Use a bandsaw to cut off the broken edge. Keep the bottom against the fence to keep the cut parallel to the bottom.



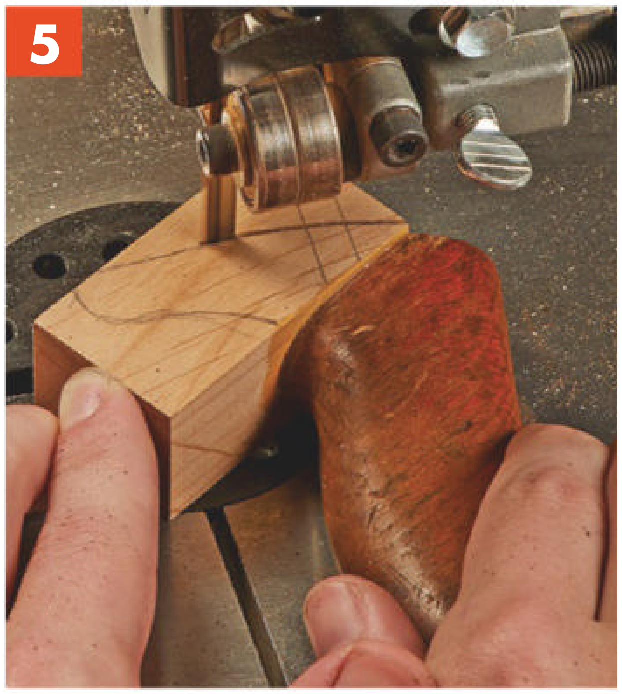
Work out the blade marks from the bandsaw on a sanding block. I found it best to keep the block in a vice.



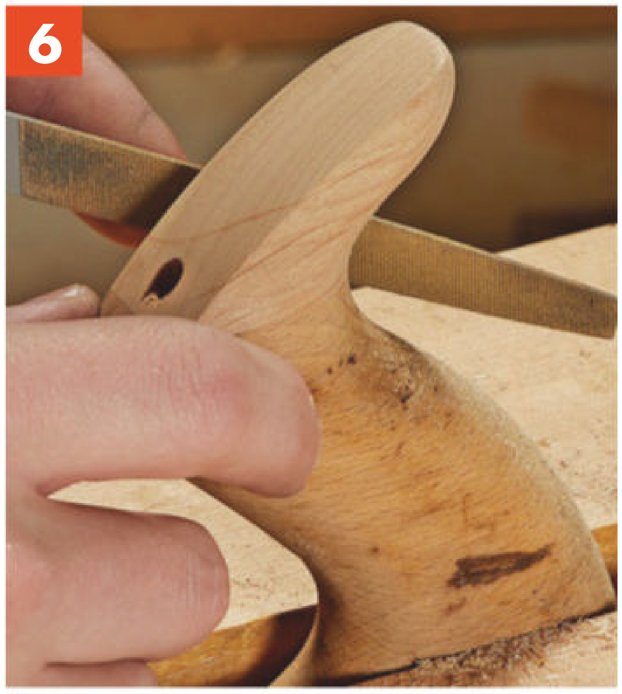
Glue up the patch and clamp it down. A few wedges work to keep the clamping pressure balanced.



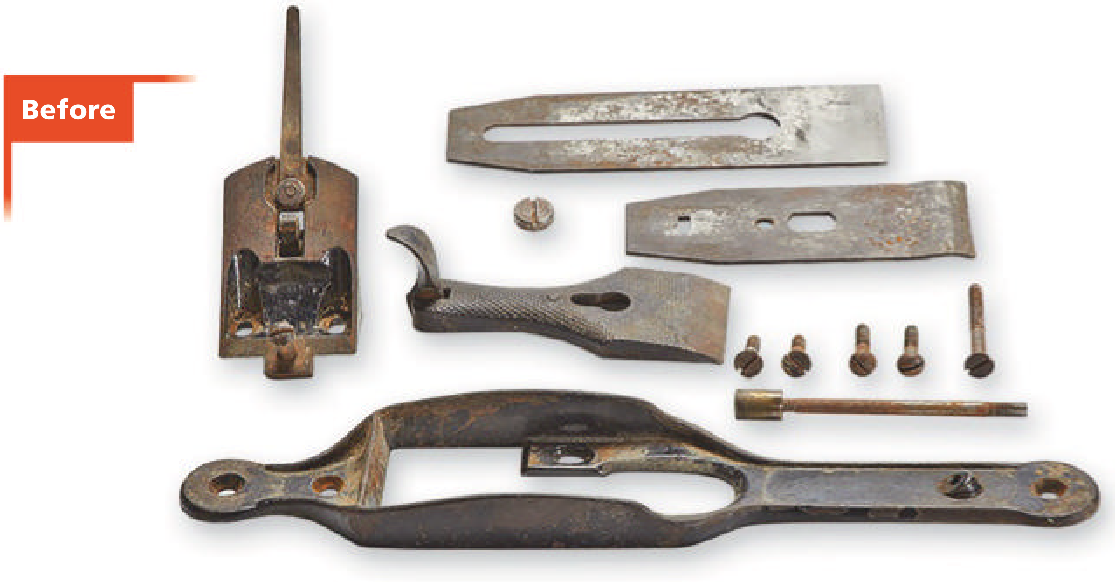
Draw out the profile of the horn. If your patch is going to cover the bolt hole on your tote, lay that out as well.



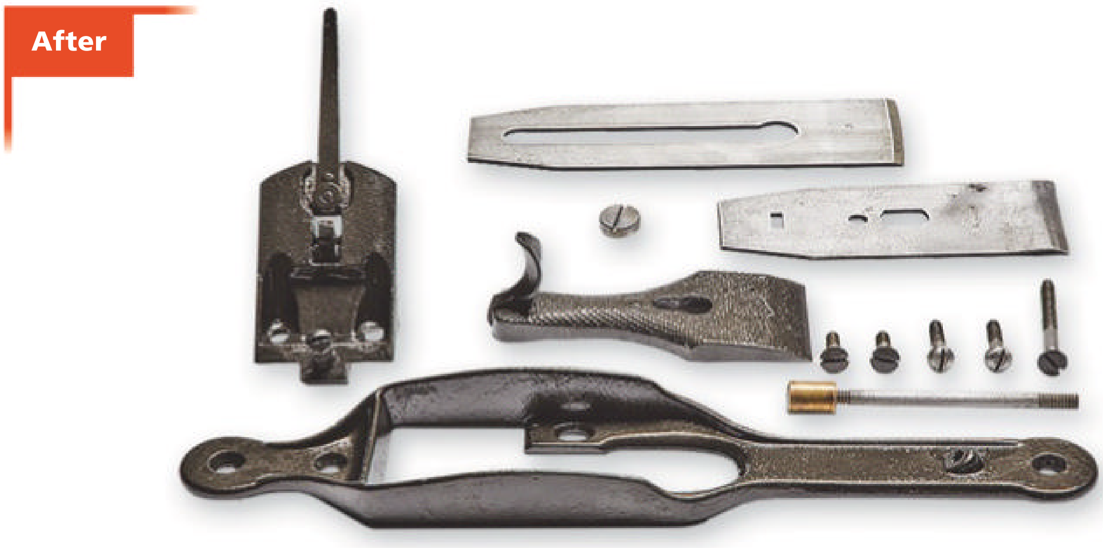
Cut the tote to shape at the bandsaw. To get a perfectly smooth and curved top, give it a pass on the edge sander.



The final shape of the tote is achieved by hand. Clamp the tote in a vice, then use files, rasps and sandpaper to refine it.



The grime and gunk that caked these pieces was taken off easily enough with a brass brush, but it took up to two days in a rust bath to get some pieces brightened up.



After coming out of the rust bath, the pieces were given another scrubbing and a light sanding with high-grit paper. The originally black pieces were painted black once more.

shown in Photo 3, the replacement piece is glued to the handle, and this is why I aim to get the top and bottom of the handle parallel: so I can simply use one clamp. A few wedges may be necessary to get the pressure right.

Once dry, lay out the shape of the horn on your replacement piece. Then take a trip to the bandsaw to cut the profile.

Now it's time to start shaping. To do this, get out your rasps and files, then clamp the tote in a vice. Now shape the handle, working on both sides to keep the handle symmetrical (Photo 6). If your replacement does cover part of the screw hole, now is the time to get out a drill and re-drill the hole.

SPRUCING UP THE CASTINGS

The last pieces of this plane puzzle were the castings. As you can see above, most of the paint had chipped off and rust covered a good portion of the metal.

First, I had to get the grime off. A brass brush did a good job of removing the dirt without marring the steel. After the big chunks were off, it was time to address the rust. Because of the sheer amount on these castings, I chose to soak the castings in a rust remover. I checked them periodically, and after two days the rust was gone.

FINISHING THOUGHTS

With all my parts rehabilitated, I only had to finish them. I sprayed a coat of paint on all the castings that orginally had been painted. For the wood, I had first wanted to do laquer, as the Stanleys originally were, but I ended up using Danish oil. This is just personal preference: I like that I can just re-oil it if it needs work again. A last coat of wax gave it a smooth, satin finish.

After a little sharpening, the plane is up and running. This restored Stanley now has a home making shavings in my workshop.

CHELATING

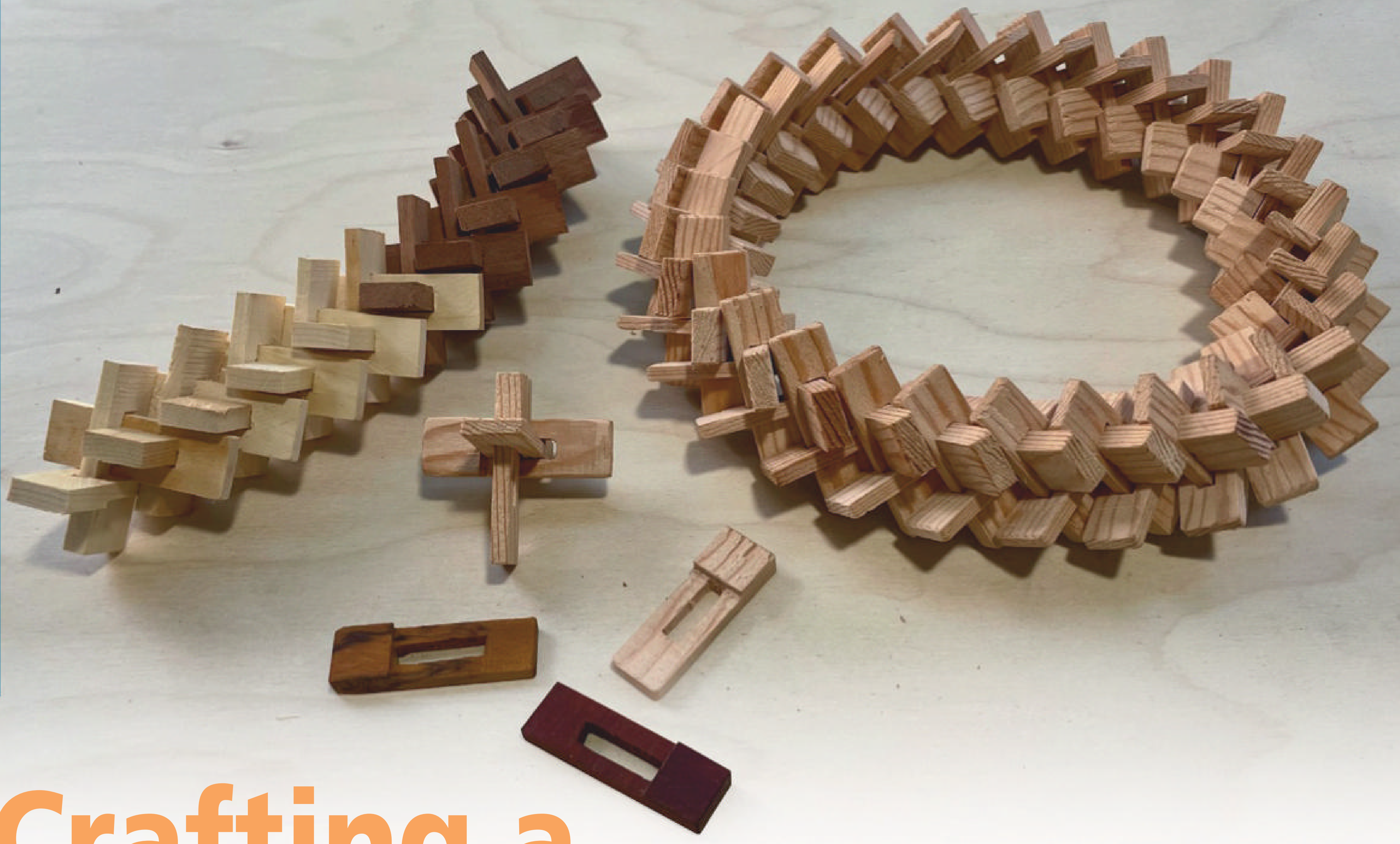
If you have time on your side and are not offended by the smell of home brew then using molasses and water to remove rust from tools and components is definitely worth pondering.

Molasses. It is hard to fathom who first realised that molasses can be used to remove rust. Maybe it was some sugar cane farmer who noticed that the black syrupy by-product of the sugar-making process cleaned his equipment. Whatever the history, it is a fact that molasses can be used to clean away rust and oxides from tools and other metal components.

The process is called chelating and it is a very complex affair. The chemical explanation is not simple, however the bottom line that needs to be appreciated is that molasses works as a chelate and can reverse the oxidation process that creates rust.

The first thing that you realise when using molasses as a chelate is that it is not toxic, you don't need gloves or a mask and that the soil that you tip the used solution into will thrive. All you need is time and patience.

The proof really is in the pudding. Six weeks soaking in a vat of 10% molasses reversed the rusting process and left the tools with an attractive satin finish.



Crafting a Swedish Ring Trivet

The Swedish trivet sitting on the dining table perplexed guests for years. Now that I know it is based on a brewer's yeast ring I have unlocked its secret.

s du brasseur

Thirty-five years ago a Swedish neighbour handed me a flat pack challenge. It had nothing to do with IKEA, rather it was two dismantled antique chairs that she had inherited from the family farm just south of the Arctic Circle. It was a real pleasure to cut away the dry rot in the European oak, copy the profiles of what some clever Swede had crafted more than 150 years ago and then re-assemble the chairs. Besides a beautiful smile, my reward was a delightful Swedish trivet. The trivet is a constant marvel. Visitors try hard to work out how it was assembled and are amazed that they can't solve the puzzle.

As you will read, I have only recently solved the puzzle myself and have now made several and am happy to share the technique.

The path to the solution came to me last year when I was sitting in a brewery in Powell River, British Columbia. Hanging on the wall of the Belgian-style brewery was the medieval yeast ring you see to the left.

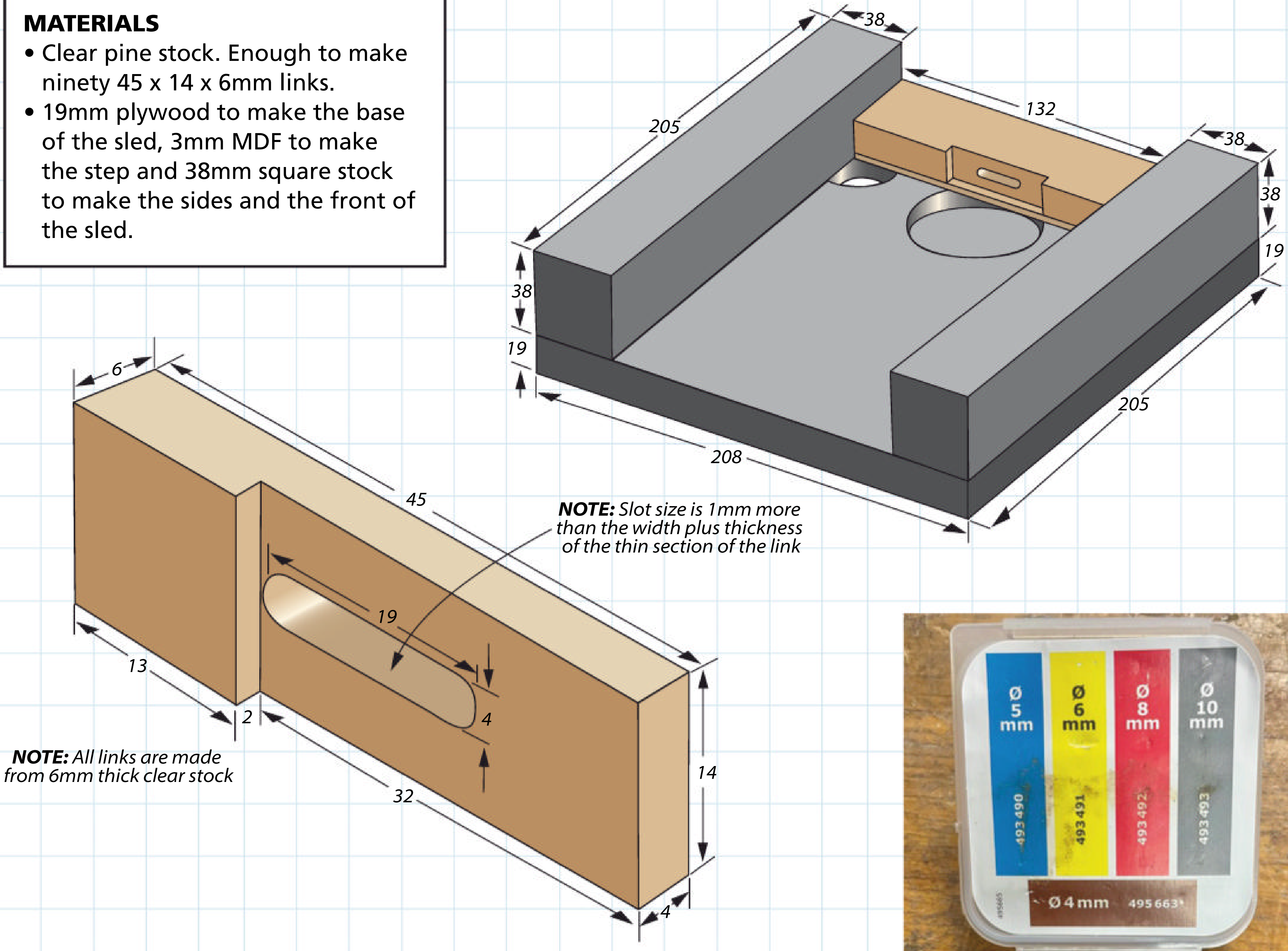
In the 16th century a yeast ring would be placed in the wort for an hour or two and then hung out to dry in the sun. The yeast would dehydrate and lay dormant until required for the next brew. Beer lovers would see the wreath drying in the sun and know there was a fresh brew of beer on tap. Reading up on hand whittled Scandinavian yeast rings explained how they lock together and inspired me to have a go at making a replica of the Swedish trivet I was gifted all those years ago.

Construction Overview / OVERALL DIMENSIONS: 208 x 205 x 57

EQUIPMENT AND MATERIALS

MATERIALS

- Clear pine stock. Enough to make ninety 45 x 14 x 6mm links.
- 19mm plywood to make the base of the sled, 3mm MDF to make the step and 38mm square stock to make the sides and the front of the sled.



NOTE: Slot size is 1mm more than the width plus thickness of the thin section of the link

NOTE: All links are made from 6mm thick clear stock

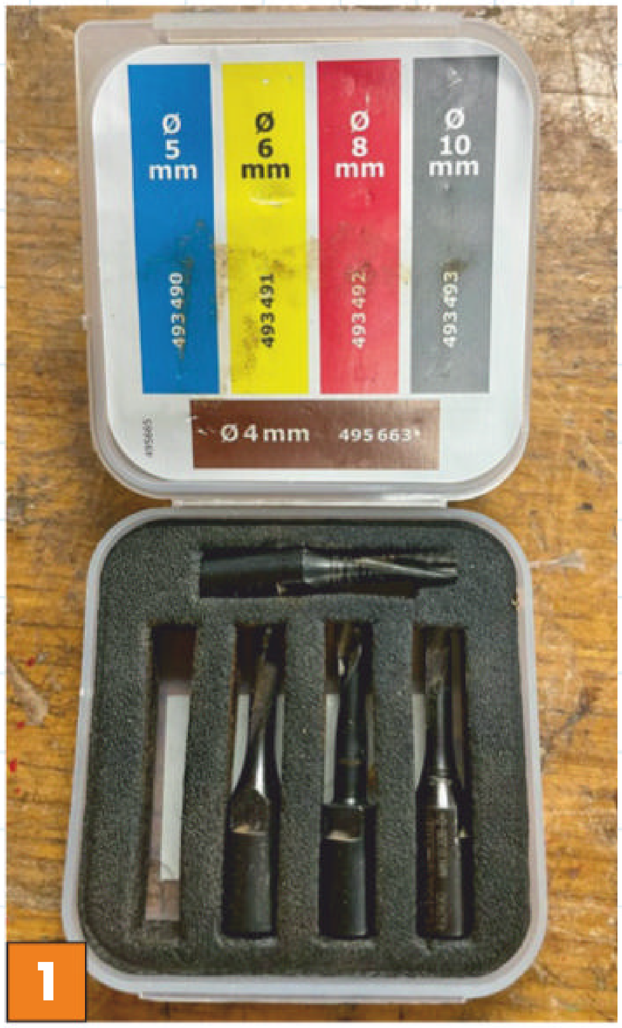
TOOLS REQUIRED

- A Festool DOMINO machine (or a drill press and heaps of patience)
- A table saw
- A bandsaw
- Block plane
- 160 grit abrasive block
- Flush cut fine toothed saw
- A 5mm chisel ground down to 4mm
- Carving jig
- PPE: facemask, respirator/dust mask and extraction

The Swedish trivet may well have evolved from a mediaeval yeast ring, however it has a much tighter weave and is made from smaller links.

When I proudly displayed my version of the trivet to my Swedish friend she was surprised to hear about the yeast ring link that I had surmised. Shasten's understanding of the trivets was that they would be made by a suitor and presented to his bride to be an example of patience and clever craftsmanship (required in a good husband on a Swedish farm).

Traditionally the Sloyd System of education had Scandinavian boys growing up with knives that they had made at school. Whittling, making spoons and other utalitarian objects was a constant hobby in downtime. Being able to whittle a trivet with 84 connecting links was proof positive that you were an able craftsman. The ring itself is made from a series of three interlocking links, usually made from straight grained pine.



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1 The diameter off the cutter will determine the length of the slot and the link. The link has to pass through the slot and allow room for another link to nest against it. That means a 14mm-wide link that has been stepped down to 4mm thickness needs to have a slot 19mm long, leaving two 13mm-long end sections and making the link 45mm long.

PHOTOS: CHRIS CLARK

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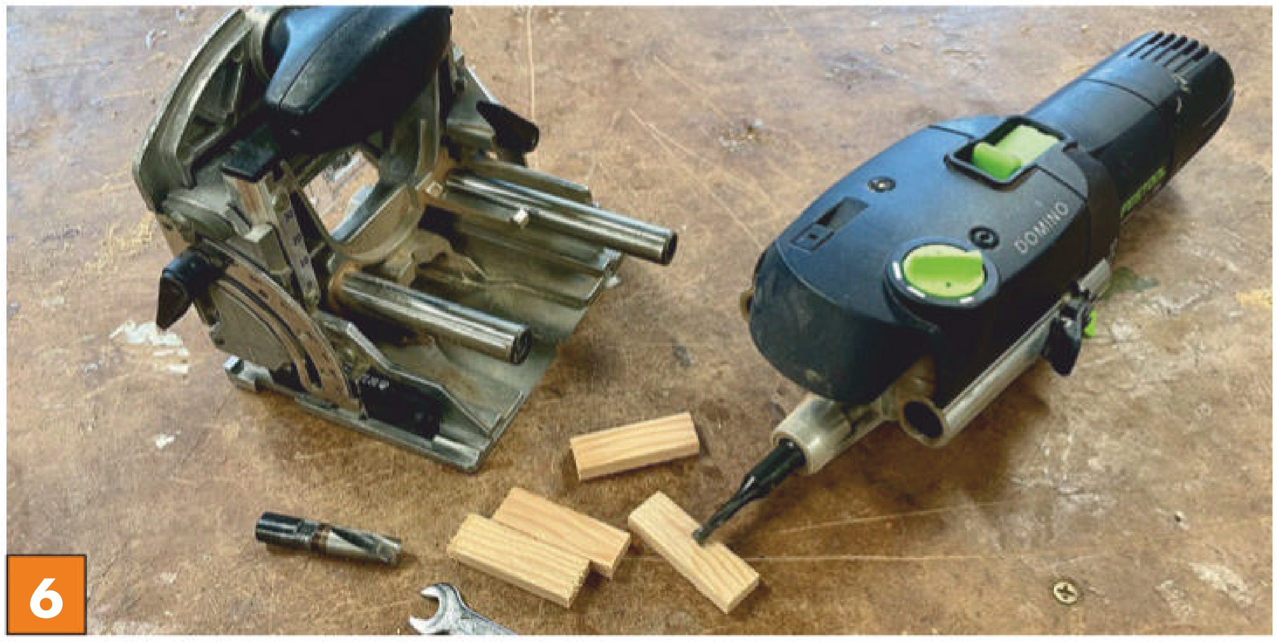


6

DRILL PRESS ALTERNATIVE

A drill press and a 4mm drill bit could also be used to cut the slots.

2 The original 35-year-old Swedish trivet was the model that I copied when I crafted the first trivet. I chose a 900mm length of 220 x 30mm old-growth, straight and close-grained Douglas fir from the wood store and ripped it into 14mm-wide sections. In the end I wanted the grain to lay horizontally across the links so that it would be as strong and robust as possible (like plywood).

3 It was a learning curve and so I didn't know how many mistakes I would make. I therefore ripped the whole board into 30 x 14mm battens and then ripped these into 14 x 6mm strips. The original trivet had links that were 45mm long, 14mm wide and 6mm thick.

4 The trivet is an assembly of links grouped together in bundles of three. The orginal had 28 groups of three links. I bundled the strips into groups of three, set a stop block up against the fence of the table saw, adjusted the distance to 45mm and locked the sections tight against the cross slide with my left hand.

5 The next step was to use the stop block itself as a push stick and use it to guide the small sections across the blade without them getting caught up against the fence and sent like shrapnel across the workshop. Like all repetitive tasks, it was a real discipline to stay focused and pay attention to where fingers were in relation to the saw blade.

6 The Festool DOMINO machine is central to the process I developed to make my version of the Swedish trivet. I did think of drilling out most of the slot on a pedestal drill and then using the drill bit itself as a reamer to remove the waste and to create the slot. However the oscillating nature of the DOMINO machine meant that it was the perfect tool for the job. I popped open the machine, removed the standard 10mm cutter that we use most often and replaced it with a new 4mm-dia cutter. If you look closely at the machine head you will notice that it is set to the widest possible oscillation. You can only change this setting while the machine is running. When I popped the faceplate back onto the machine I switched it on and changed the oscillation setting to the smallest arc possible.

7 Making the sled for the DOMINO cutter was a straightforward process. The first step was to machine some pine stock into 38 x 38mm sections and then lay these against the saw fence. I then placed the Festool DOMINO machine between the pine sections and the saw blade. A section of 19mm plywood was then cut to width and docked 205mm long. I glued and screwed the 38mm-wide pine sections to the sides of the sled and then machined some stock to 38mm x 14mm before docking it 132mm long. This section then had a 3mm-deep slot centred on the edge to hold the links while they were being machined. At this point I used a 52mm-dia Forstner bit to drill a waste reservoir. Before I screwed the end piece in place I cut some 3mm-thick MDF to length and width and used it as the step for the links to sit on.

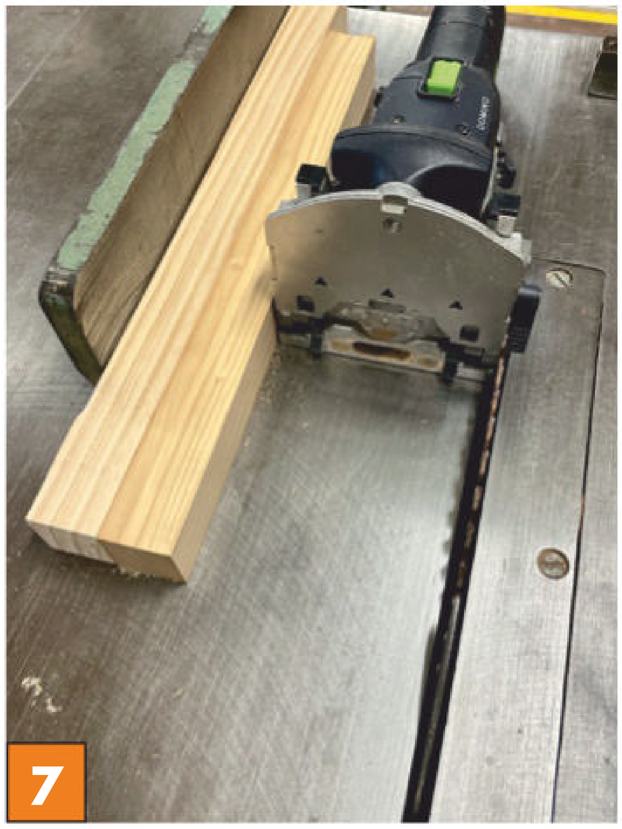
8 The DOMINO fence needed to be raised 10mm so that the machine could run smoothly in and out of the sled. It was a bit tentative at first but I soon got the hang of it and was able to use finger pressure from my left hand to hold each link in position while my right hand guided the DOMINO along the sled.

9 Wood dust started to accumulate in the left hand corner of the jig. This frustrated me for a while, requiring me to tip out the saw dust every third link. This problem was solved by drilling 32mm-dia waste holes in both corners.

10 As you can see I used a MagSwitch at a stop on the bandsaw when cutting the shoulders.

11 I wasn't happy with how flat the table on the bandsaw was so solved this problem with a sheet of 3mm plywood. Bundling two links together proved to be the most efficient way to cut the slot shoulders.

12 The next step was to set the MagSwitch stop closer to the blade so that the 4mm keys could be cut. The best way to achieve a smooth cut was to use a pencil as a guide.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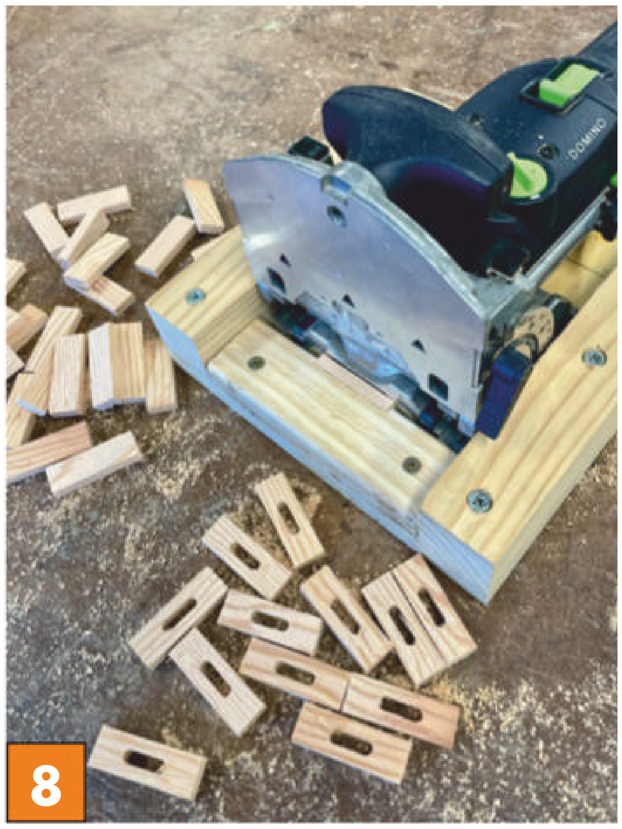
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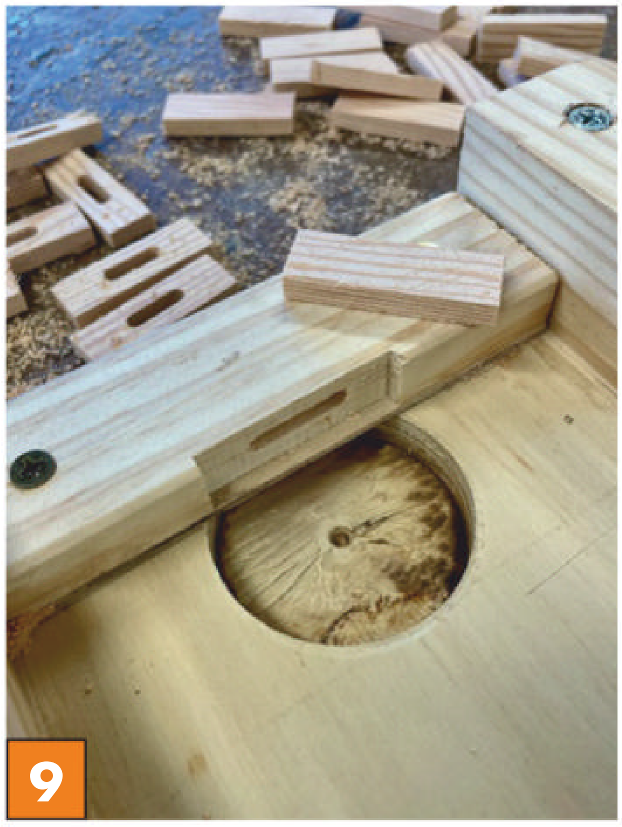
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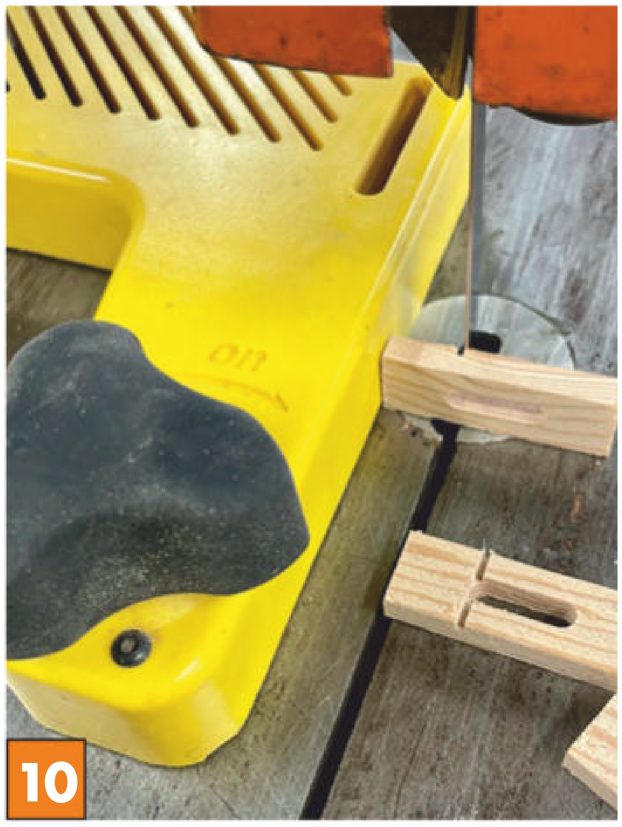
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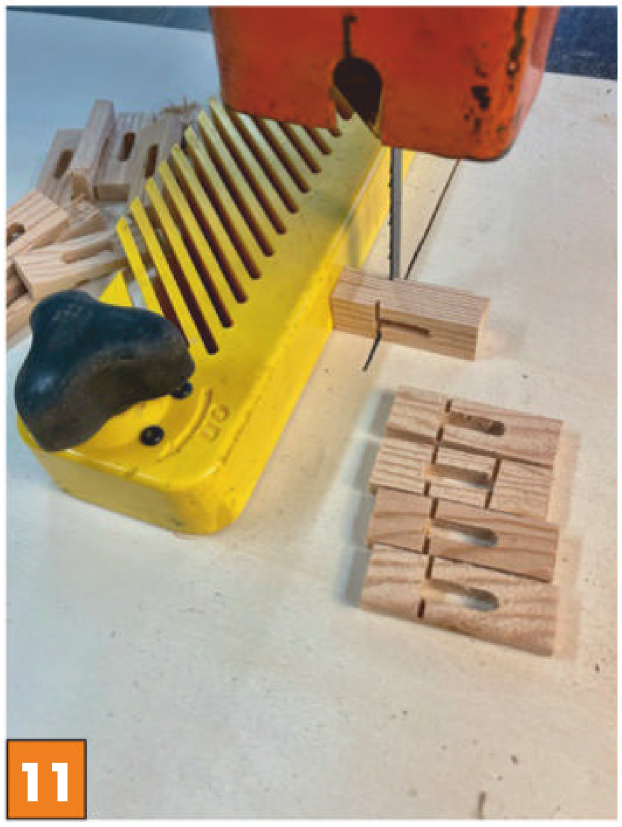
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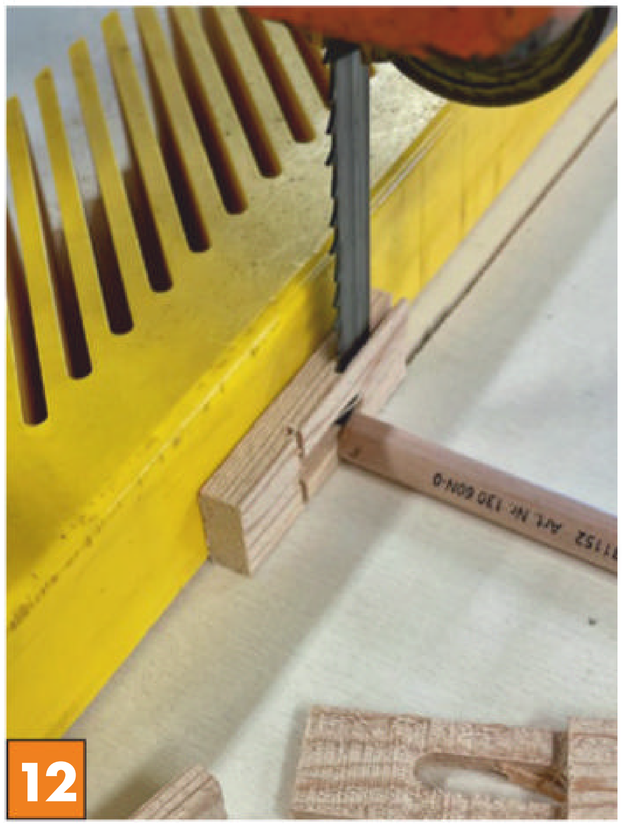
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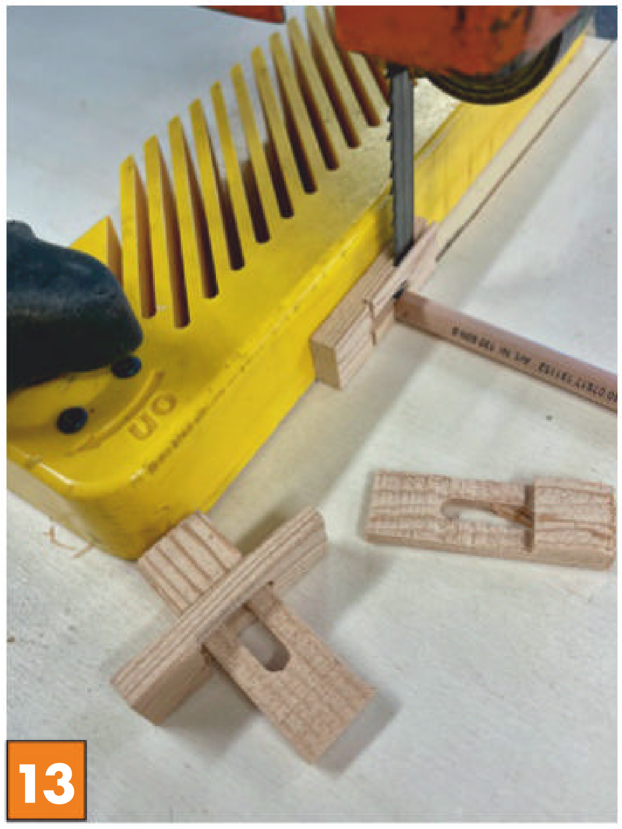
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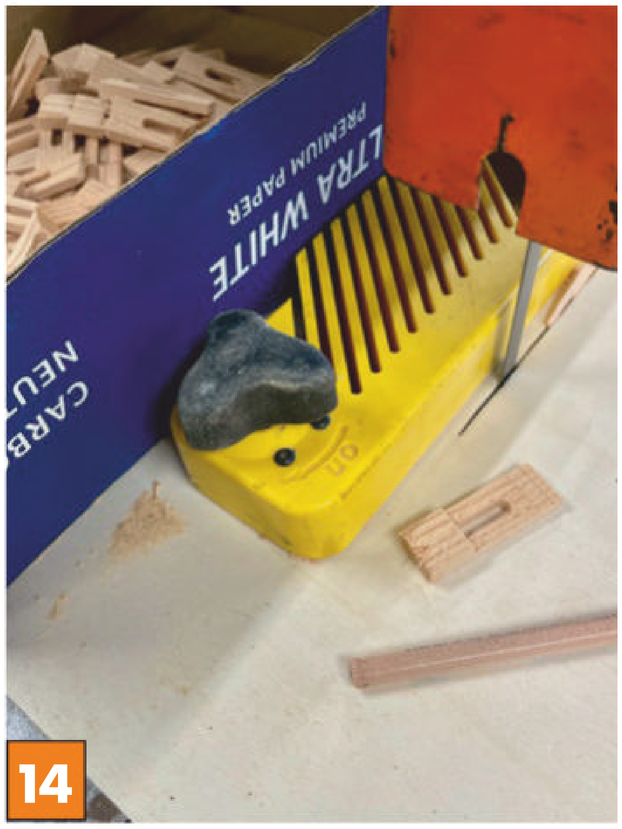
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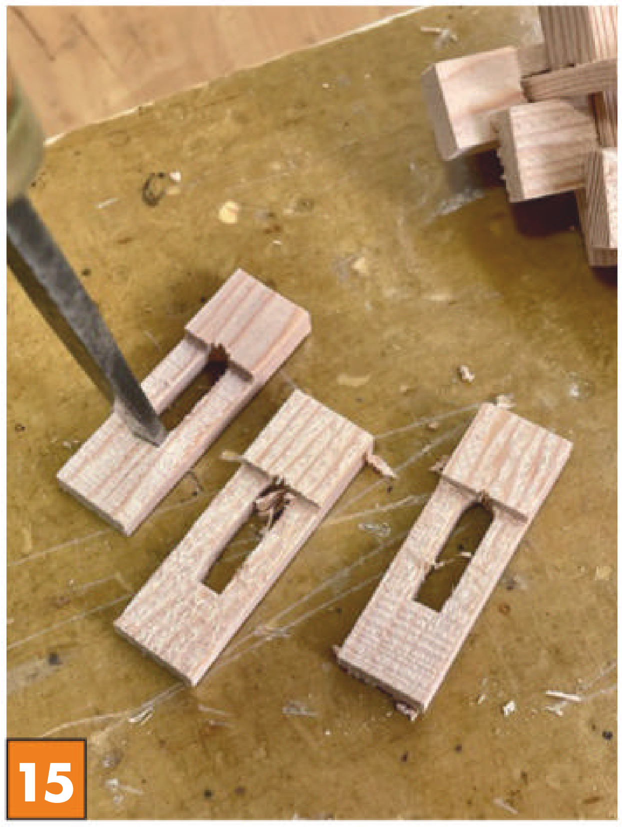
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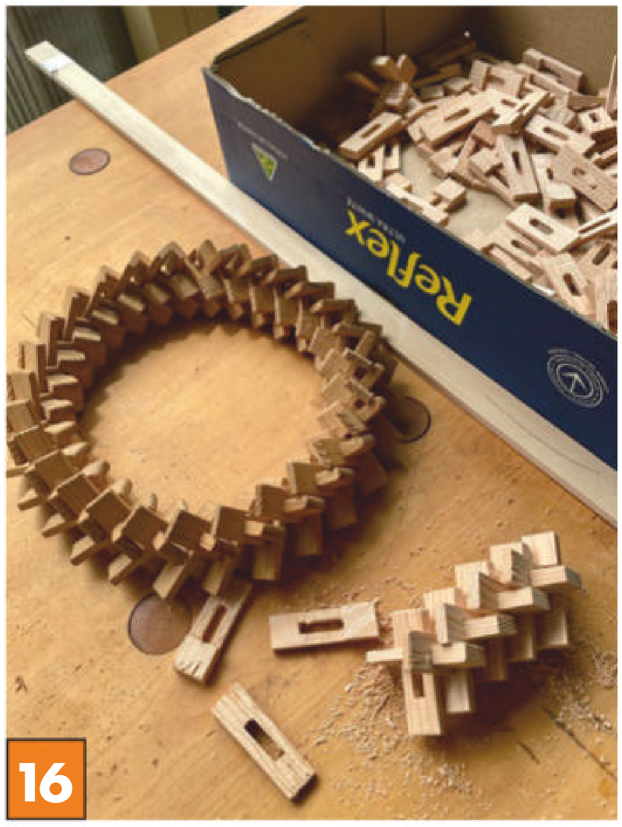
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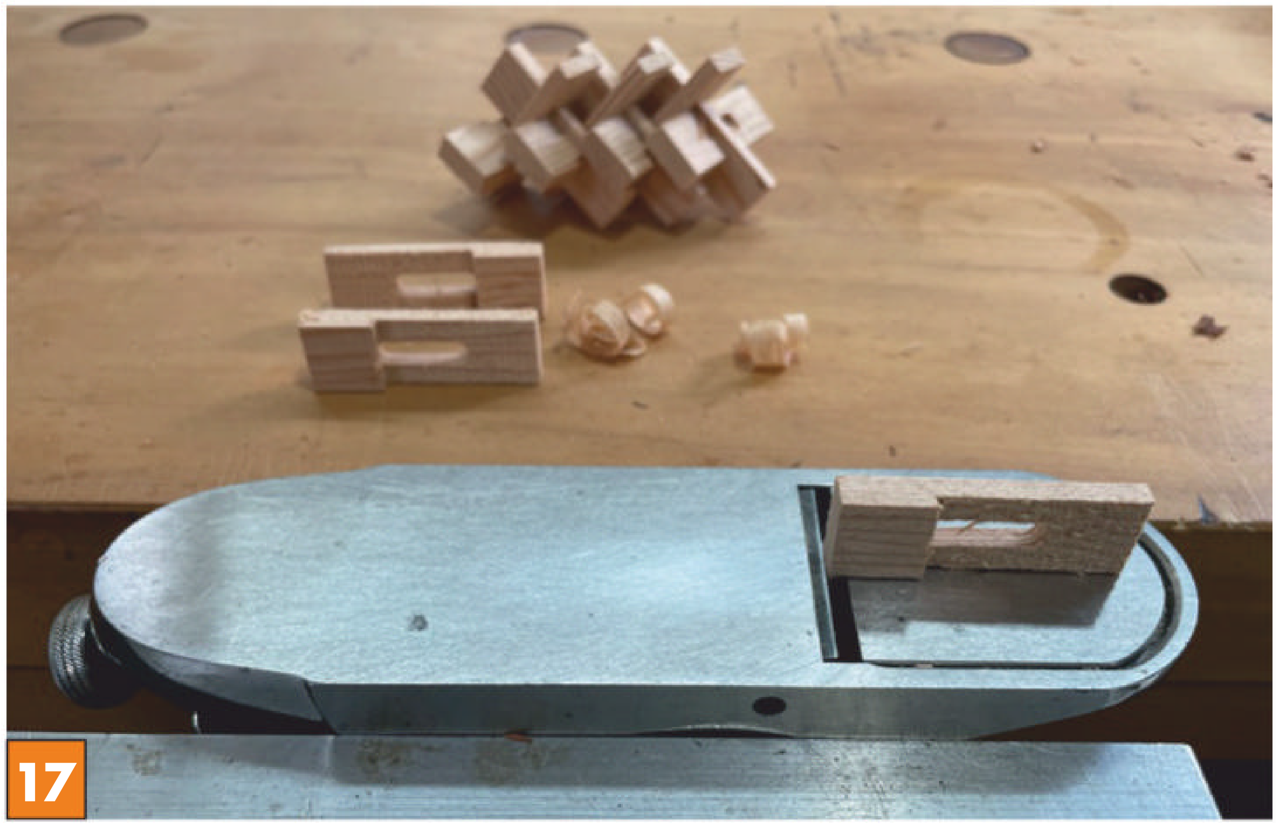
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13 Eighty-four links had to be cut to make just one trivet. In the end I was able to harvest 200 links from one piece of 900 x 220 x 30mm stock. To prove that blade tension wasn't drifting I tested every second link to make sure the setting was accurate and the key thickness remained 4mm. The MagSwitch proved itself to be an excellent fence. The strong magnets held the fence in place even though it was sitting on a 3mm-thick piece of plywood. The plywood itself reflected light onto the blade, illuminating the cut and providing a clean surface to work on.

14 In this photo you can see that I overcut the kerf and then backed off so that the fine shavings could drop down into the bandsaw instead of building up on the table. Also note that a fine offcut from a key is stuck in the kerf behind the blade. I solved this problem by enlarging the back kerf so the offcuts could also fall through.

15 The smallest arc setting on the DOMINO machine (for the 4mm-dia cutter) is 18mm. I needed the slot to have square ends and be 19mm long. To do this I ground a 5mm-wide chisel down to 4mm width and then used it and a light Japanese-style hammer to square the slots and create a 19mm-long rectangle.

16 When I first assembled the links into a daisy chain they ended up looking like a taught spine and lacked the flexibility required for them to curve into a tight circle. My focus on accuracy and fine tolerances was misplaced!

17 To solve the flexability issue I inverted a finely set block plane in the vice and used it as a jointing plate. After I had removed two fine shavings from the sides of the link I then pivoted the link on all of its edges and planed a very narrow chamfer. This softened the look and improved the feel of each link. An impossible process once the links had been woven into a chain.

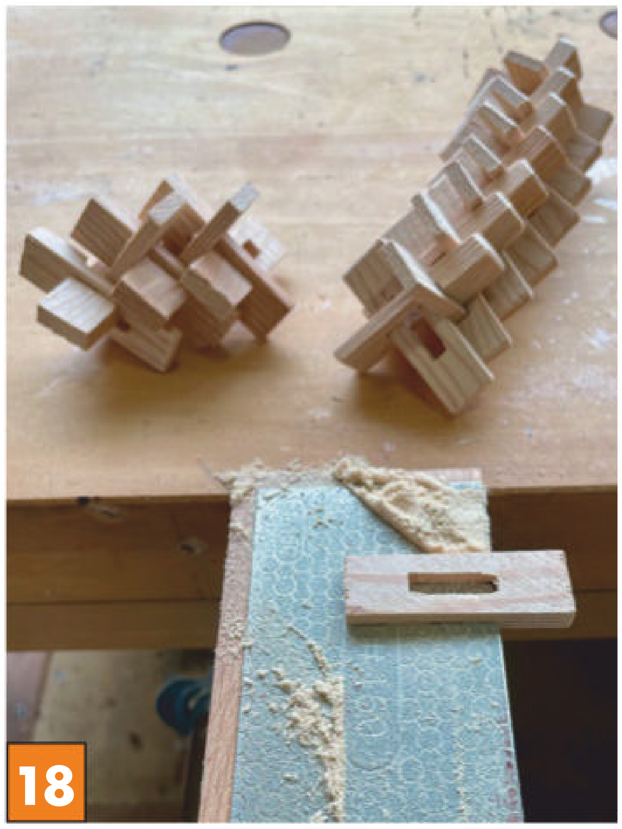
18 The process that took the longest time for each link was sanding the saw marks from each cut surface. In the past I had mounted diamond foils on beech timber blocks and used them as sanding pads. I mounted the 160-grit diamond pad in a vice and planed one edge down so it was flush with the foil. Mounting the block horizontally in the vice gave me a comfortable height to work with and an abrasive face that I could use to smooth away the saw marks.

19 Progress was slow as I methodically sanded each link and then threaded it onto the ever growing wreath.

20 The key to locking the wreath together was to use the finest blade in the workshop to cut away the end of the slot in the last link. A Japanese flush cut blade did the trick, however I could have used a sharp chisel to split a link down the centre, wiped glue on the surface and then reassembled it in place.

21 Initially I locked 87 links together to make a tight wreath, however after playing around with the wreath for a day it became limp and not as tight as I wanted it to be. Removing a group of three links tightened up the wreath. A dab of glue on the missing section and a bulldog clip closed the circle.

22 The end result was a delightful Swedish ring trivet; a journey that started 35 years ago when I was gifted a ring trivet by my Swedish neighbour. Before you start on this journey you need to realise that each of the 84 links needs to be cut to width and thickness, docked to length, the slot machined, the shoulder cut and the key ripped, the sides planed and the faces sanded. In all each link required eight distinct processes to be carried out. Turn the page to read about some shortcuts that I developed and some colour variations that I played with while building more trivets. For more information see Sources on Page 73.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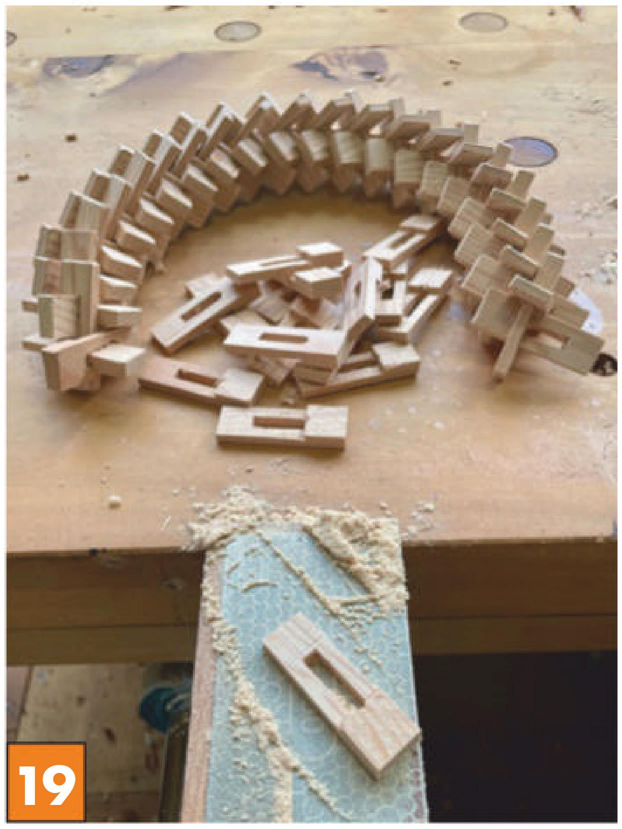
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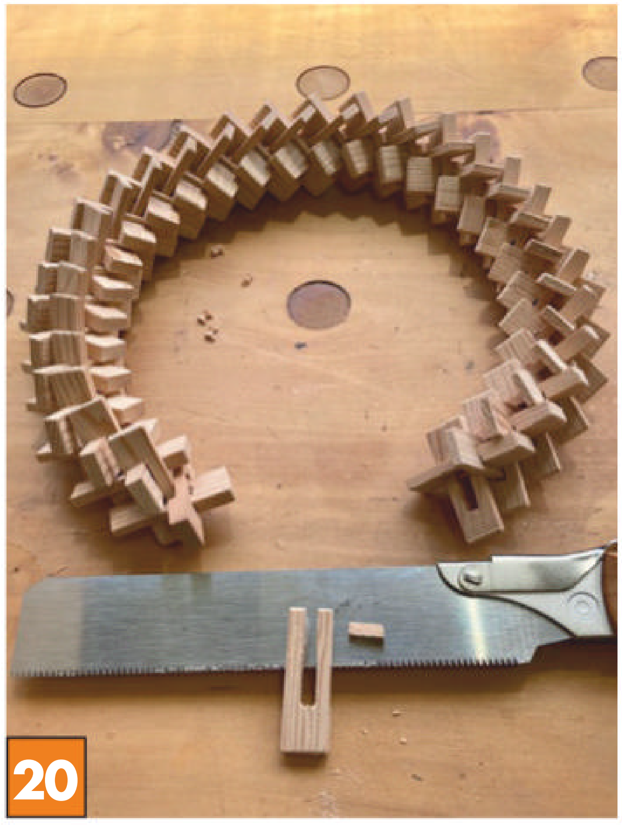
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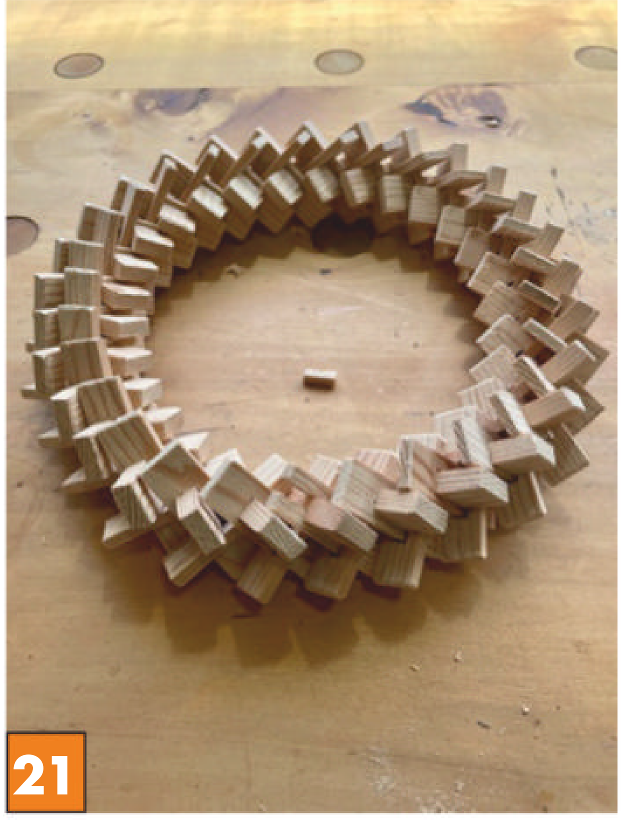
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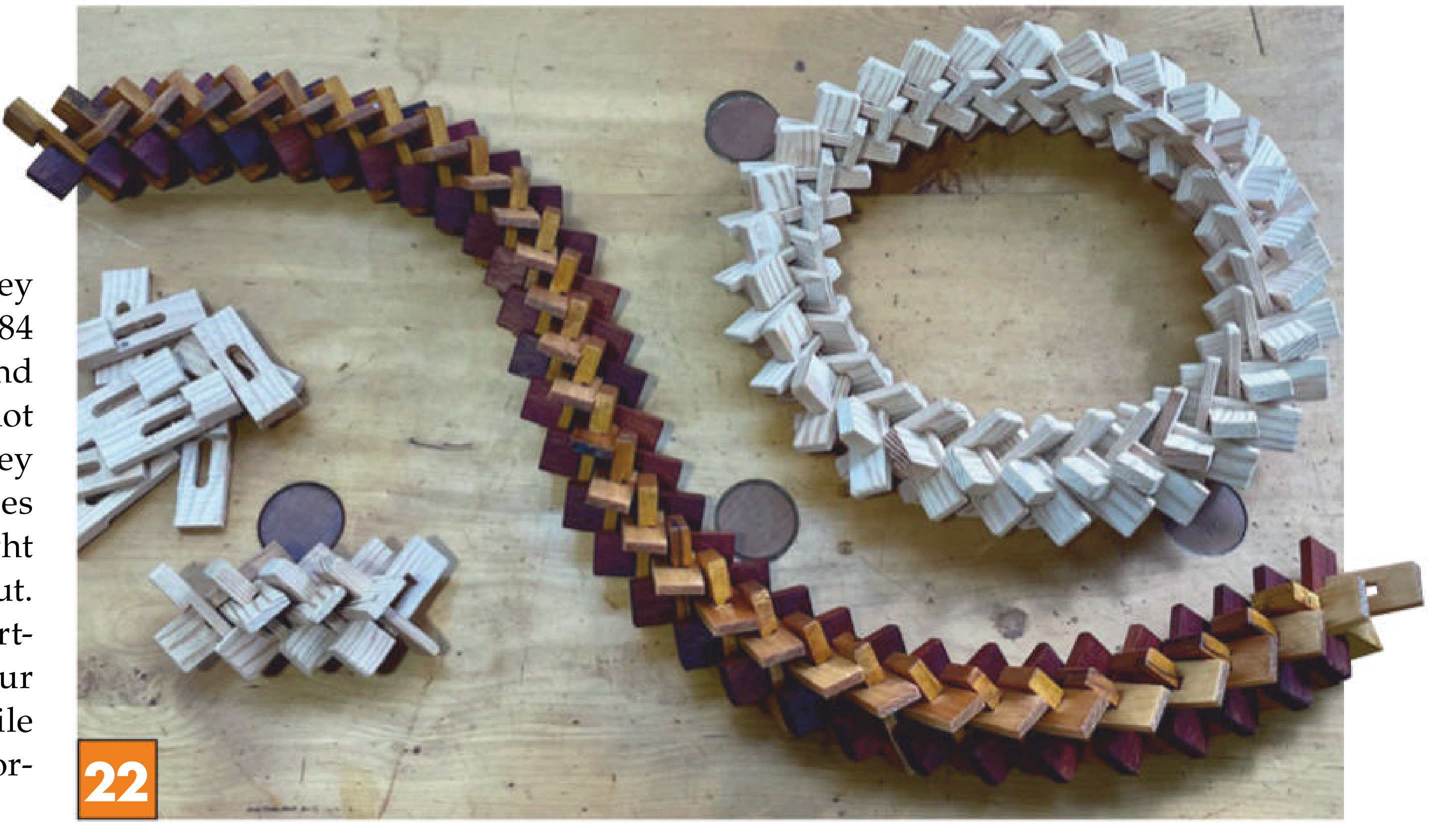
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Swedish Ring Trivet Options

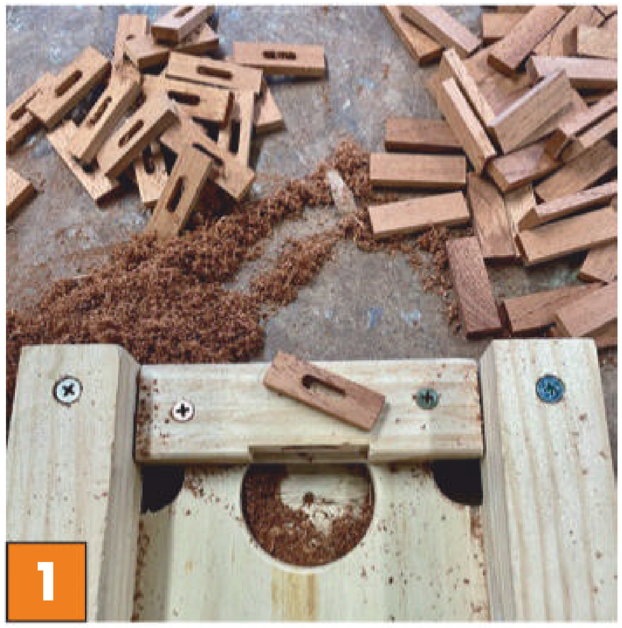
Shortcuts and colour options for ring trivets. Traditionally yeast rings were made from pine because it was easy to whittle and was flavour neutral.

Traditionally brewers and dairies used pine pails and tubs to collect milk and brew beer. The pails and tubs would have been washed with water and then placed out in the sunshine and wind to dry and sterilise. The yeast ring on page 36 is made of pine so that it too could be sterilised by sunshine and not impart any flavour to the beer. Modern Swedish ring trivets are made from pine as a nod to this mediaeval tradition.

Building a trivet from contrasting timbers was the next step in the adventure.

The second trivet I made featured three different species of timber; rosewood, kauri pine and Leichhardt pine. The third trivet was assembled out of rosewood and Canadian white cedar links.

Trivet No 2 featured 28 bundles of three contrasting links, while trivet no 3 was made from two groups of 14 contrasting bundles. I chose to oil the links in trivet No 2 and leave the links in trivet No 3 raw.



1

1 As you can see to the left, the first innovation in the production process was to bore two 32mm-dia waste holes all the way though the sled so that sawdust that collected in the corners would drop away and not build up and make its way under the DOMINO machine as it slipped in and out of the sled.

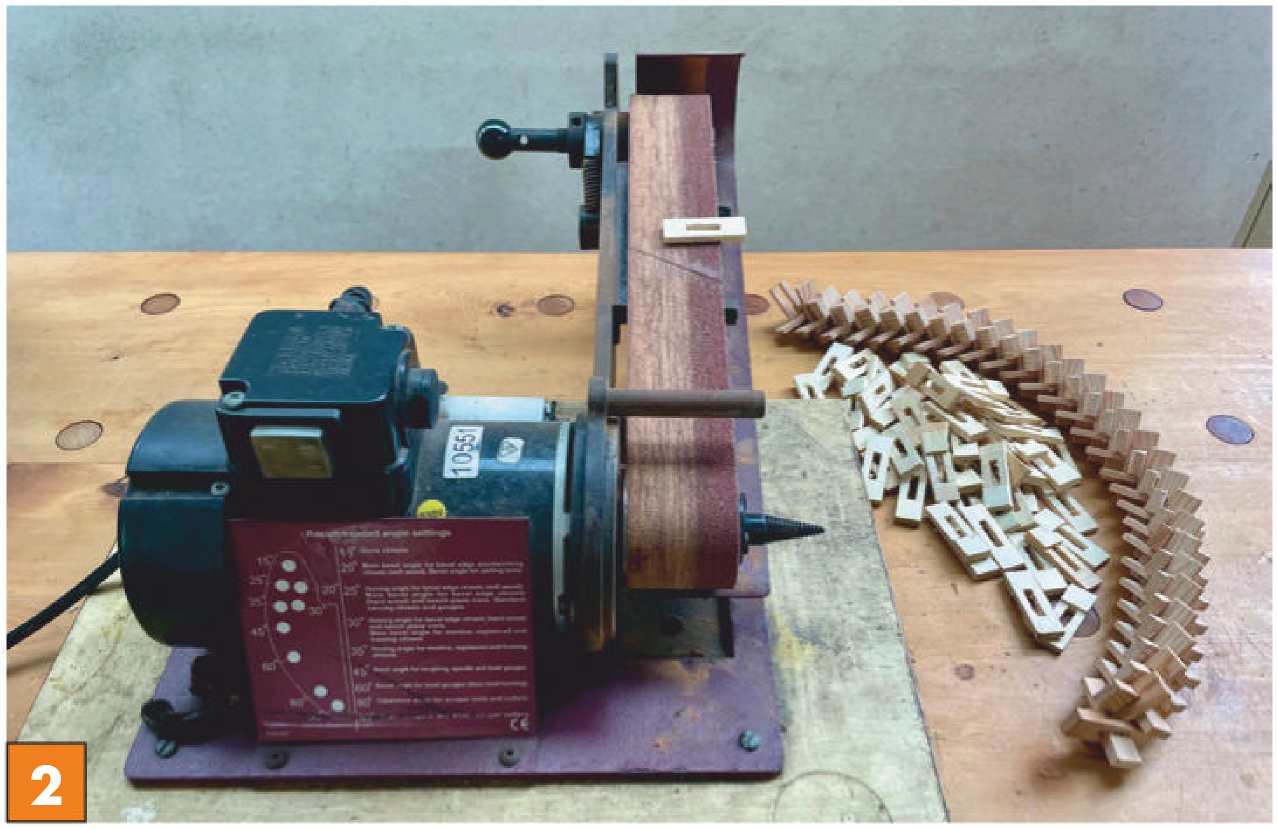
2 I have only ever used the Robert Sorby Pro Edge to sharpen chisels and plane blades. After sitting at the bench for hours on end sanding each link by hand I thought there must be a quicker way. The solution was to remove the tool holder from the Pro Edge machine, lay it as flat as possible and then use it as a linishing machine. A 160-grit belt did a fine job removing the saw marks however I still used the diamond foil block to chamfer the edges.

3 After I had made 30 rosewood, kauri and Leichhardt pine links I placed them in a glass tray, sprayed them with camellia oil and rubbed them down by hand so the fine oil would penetrate the end grain. I started with the blonde kauri links, moved on to the yellow Leichhardt pine and then used the same bath to oil the rosewood.

4 As each link came out of its bath I wove them together in a daisy chain and placed them on kitchen paper to absorb the oil and dry out. Notice how the fine dust that got caught in the pores of the rosewood has stained the kitchen paper. If I had assembled the wreath and then dunked it in oil the colours would have run and the strong contrast would have been lost.

5 The trivet made with three contasting timbers ended up being my favourite. From every angle it is eye-catching. I chose to make the rosewood key as the locking link in the chain. The glueline disappeared into the deep red tones of the link.

6 The Canadian white cedar and Australian rosewood (some call it scented rose mahogany) are both aromatic timbers and definitely not appropriate for use as a yeast ring. The colours remind me of the Canadian flag and sailing adventures that led to enjoying a West Coast IPA in the Belgium-style Townsite Brewery next to Canada's shortest river (Powell River). I had thought of weaving rosewood and white cedar links together but was not happy with the odd-looking result. Bundles of three different species work fine, otherwise the bundle needs to be one species.



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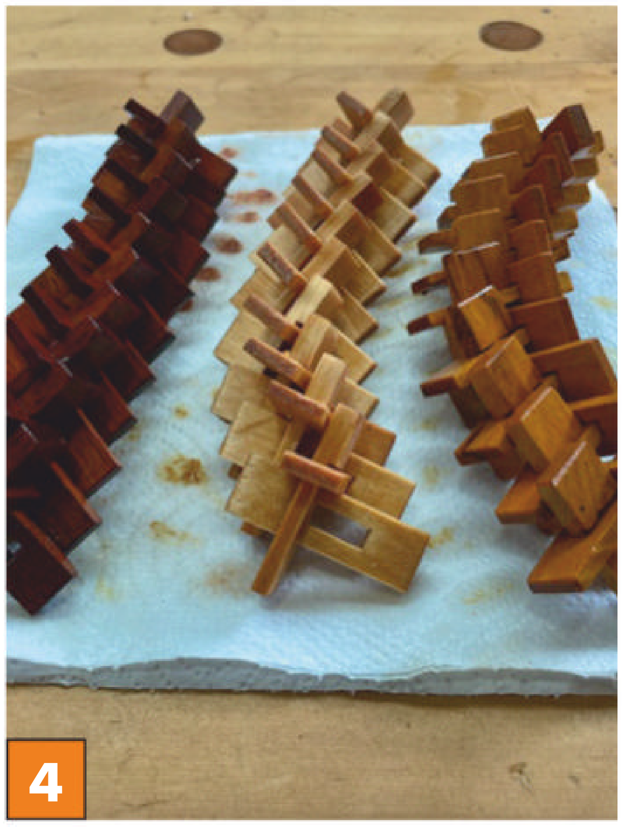

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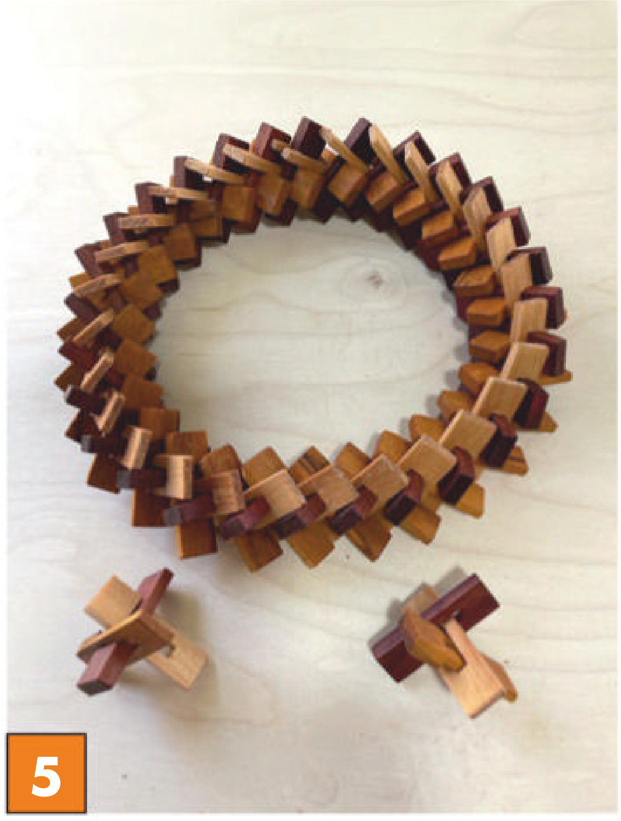

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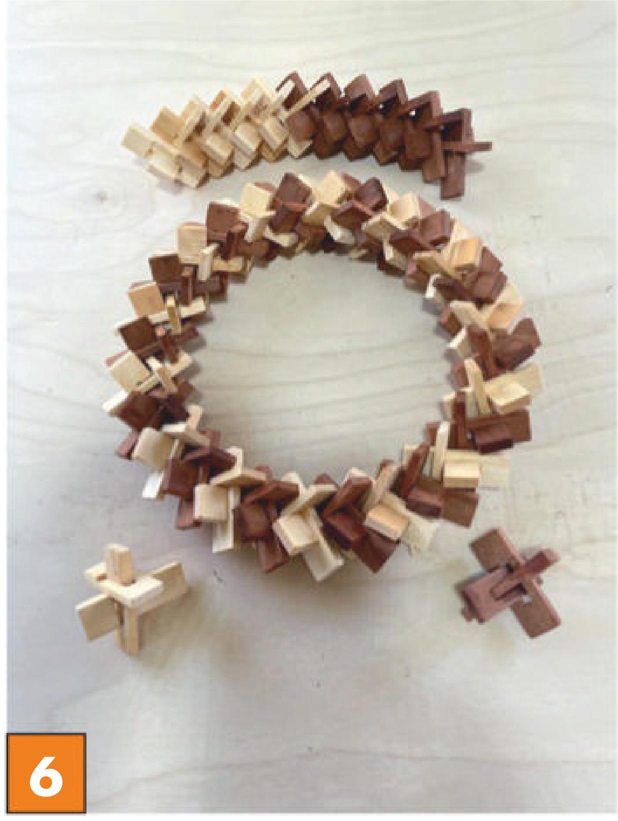

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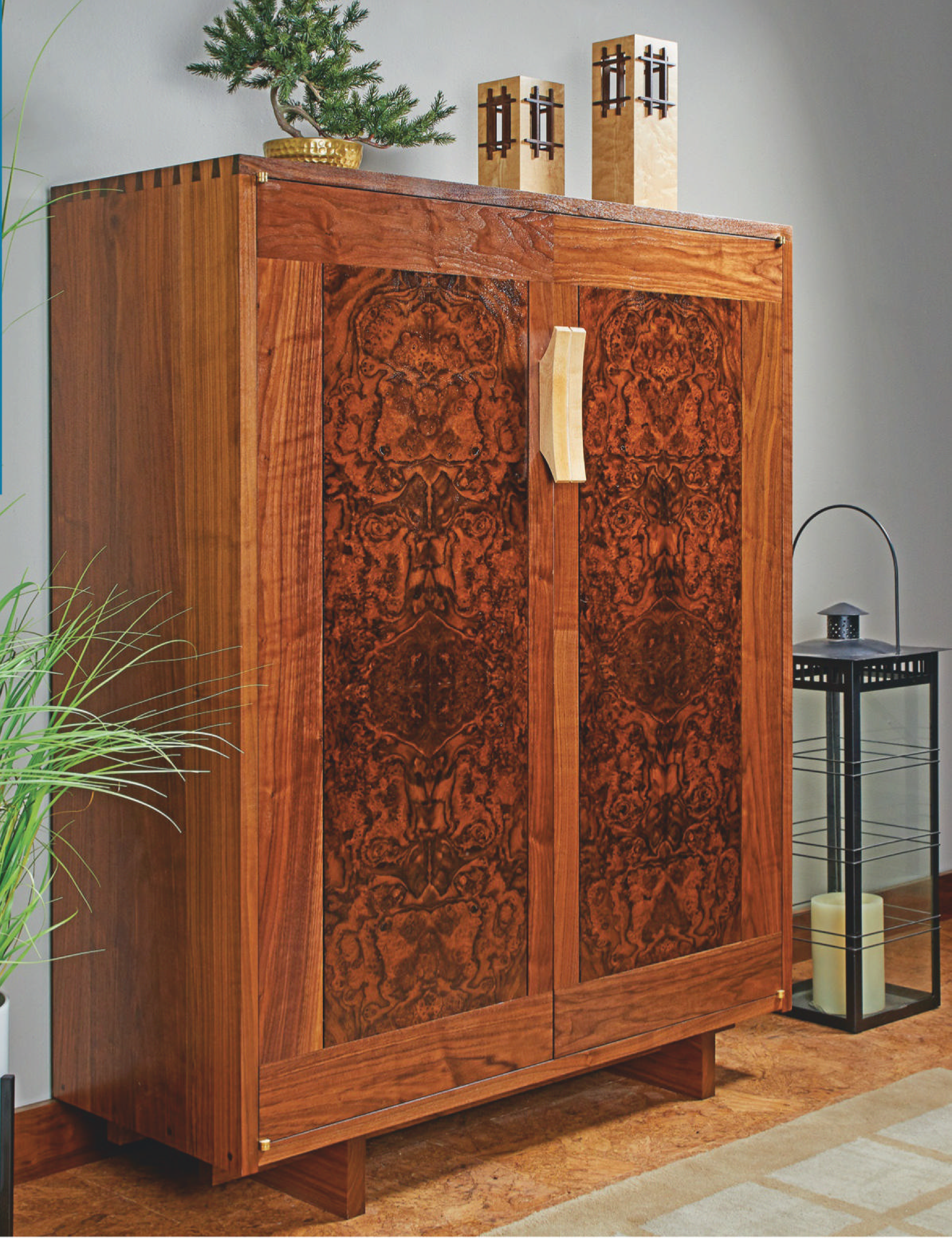
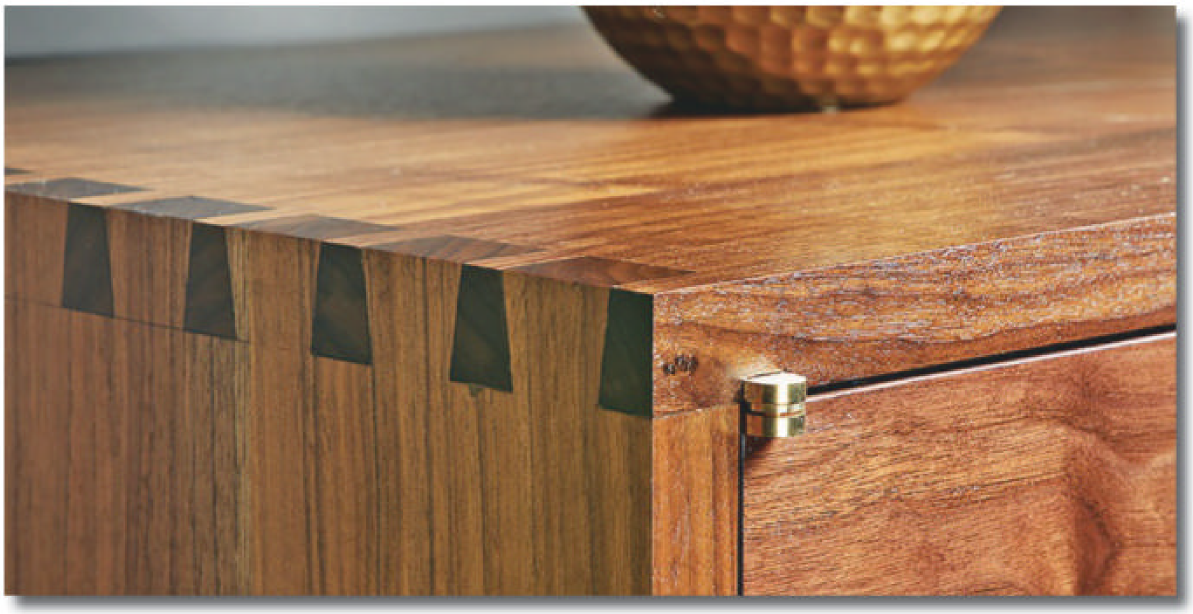
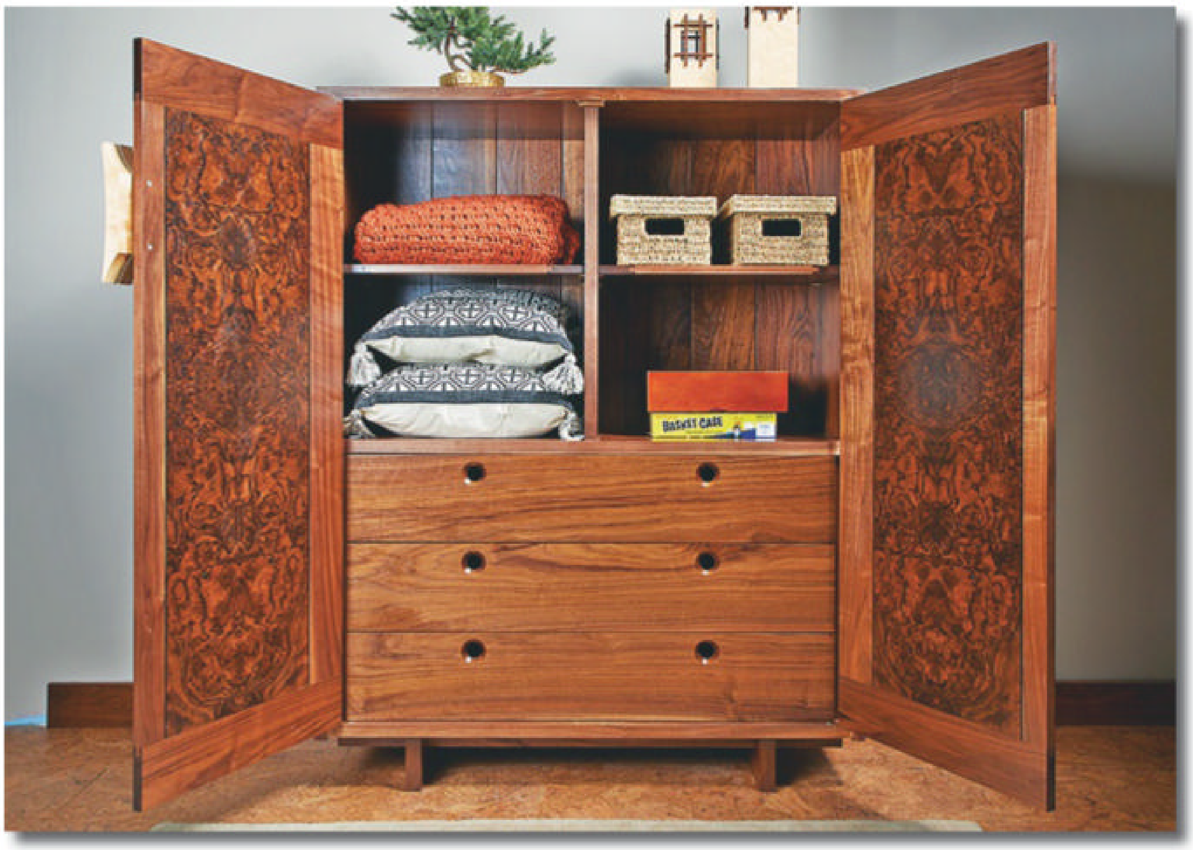


Bahut Cabinet

Top to bottom, front to back and side to side, this cabinet is a beauty. It's a workout in the workshop — but the results will provide a lifetime of joy.



▲ Dovetail joinery that joins the top to the sides provides visual relief and interesting punctuation to the large panels. The pivot hinges are a strong but discrete way to operate the doors.



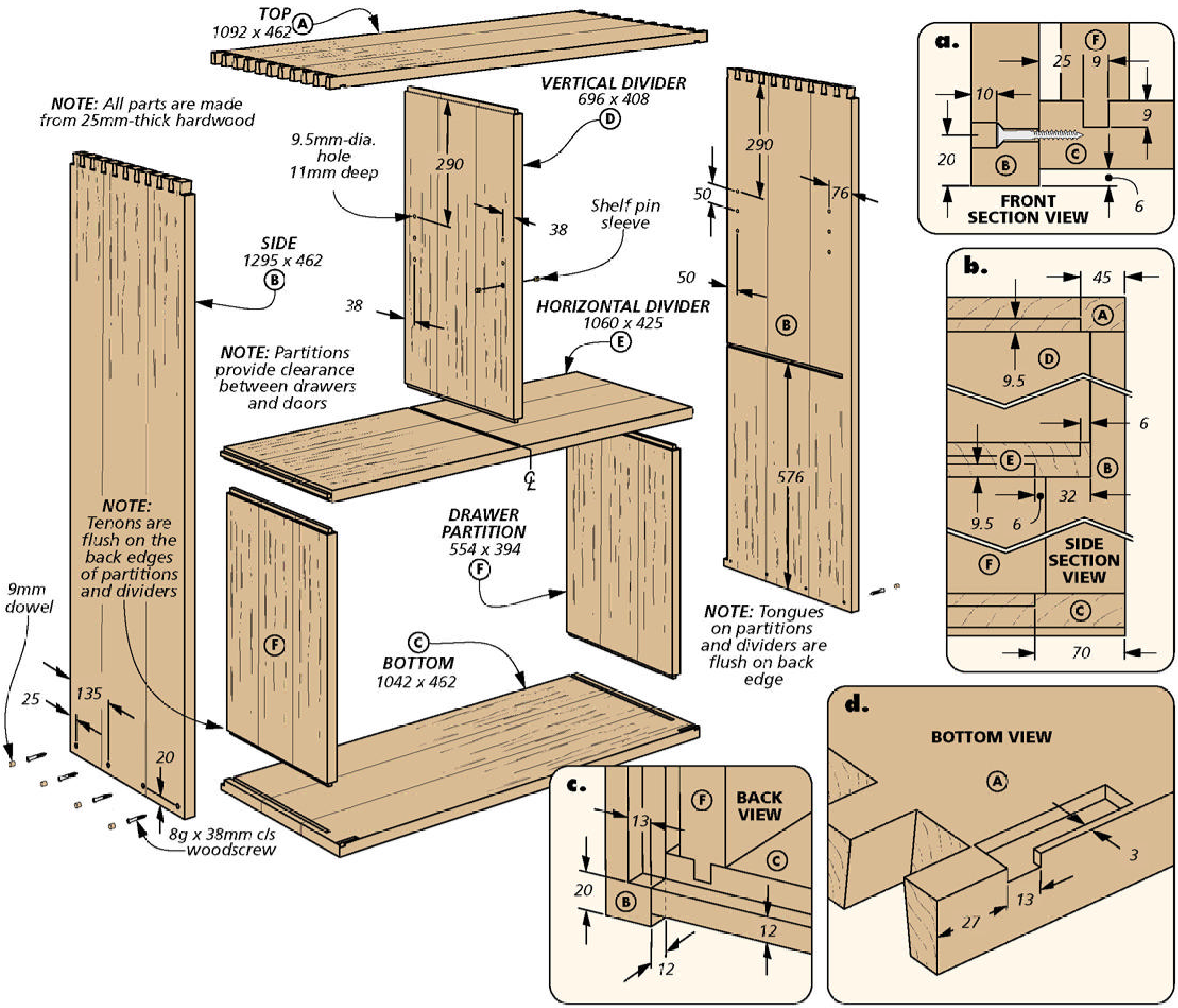
▲ Inside the cabinet you'll find ample room to store whatever particulars could be needed in the room the cabinet occupies. The solid walnut drawers add abundant storage options.

▲ A large burl block (like this one) was a signature pull on Mr. Nakashima's Bahut cabinets. Dillon found this one on eBay. Mount it to the left door for an authentic look.

If you've never heard of George Nakashima or built any of his objects (he doesn't call them projects) you're in for a two-fisted, heavy-duty, deceptively simple, ruggedly delicate woodworking journey. All the paradoxes described here are fitting when it comes to the designs and life work of Mr. Nakashima. He was passionate about building, beauty, woodworking and trees.

He treated trees as sacred objects, and many of his thoughts on trees were captured in the book he released in 1983 *The Soul of a Tree*. Here's a quote from his website that gives you a feel for the reverence that he has for trees. "In Japanese, kodama, the 'spirit of a tree,' refers to a feeling of kinship with the heart of a tree. It is our deepest respect for the tree...that we may offer the tree a second life."

Now that you're aware of the broader background of this woodworker, let's hone in on Dillon Baker's interpretation of the Bahut cabinet. As you see in the pictures here, the cabinet is mainly made of thick walnut. Not only is walnut used in the drawer fronts, but the sides and back of the drawers also. The back of the cabinet is good looking as well; it's ship-lapped walnut slats — giving you the option of using the cabinet as a room divider if you so choose. The only plywood here is used for the drawer bottoms and as substrate for the walnut burl veneered door panels. Clearly it's time to roll up your sleeves and head to the workshop.



TOP A
1092 x 462
NOTE: All parts are made from 25mm-thick hardwood
VERTICAL DIVIDER
696 x 408
D
9.5mm-dia. hole 11mm deep
290
38
Shelf pin sleeve
SIDE
1295 x 462
B
38
50
HORIZONTAL DIVIDER
1060 x 425
E
NOTE: Partitions provide clearance between drawers and doors
290
50
76
576
NOTE: Tenons are flush on the back edges of partitions and dividers
DRAWER PARTITION
554 x 394
F
9mm dowel
25
135
20
BOTTOM
1042 x 462
C
8g x 38mm c/s woodscrew
NOTE: Tongues on partitions and dividers are flush on back edge
a.
FRONT SECTION VIEW
25
9
10
9
20
6
b.
45
9.5
6
32
9.5
6
SIDE SECTION VIEW
70
c.
BACK VIEW
13
20
12
12
d.
BOTTOM VIEW
3
13
27

Making a strong CASE

When I suggested rolling up your sleeves, I meant it. This cabinet is a beast. All of the parts you see here are made of glued-up 25mm-thick material.

Sorting, selecting and prioritising the material for the case is one of the reasons Mr. Nakashima's objects are so highly prized. You should follow suit and pick the best material for the top, sides and horizontal divider. When all of the panels have been glued up, cleaned and trimmed to size, you can focus on the first of your joinery tasks — some big hand cut dovetails.

HAND CUT DOVETAILS. There's a primer for making hand-cut dovetails at Australianwoodsmith.com.au. The drawing at the top of the next page shows the layout of the pins on the top. The pins are used to locate the tails on the side. You can minimise sawing vibration in these big panels with good clamping strategies at the bench.

Test-fitting the dovetails ensures good-looking joinery, and also lets you get an exact measurement for the length of the bottom. Then you can pull the pieces apart and drill the counterbores and pilot holes in the sides (detail 'a').

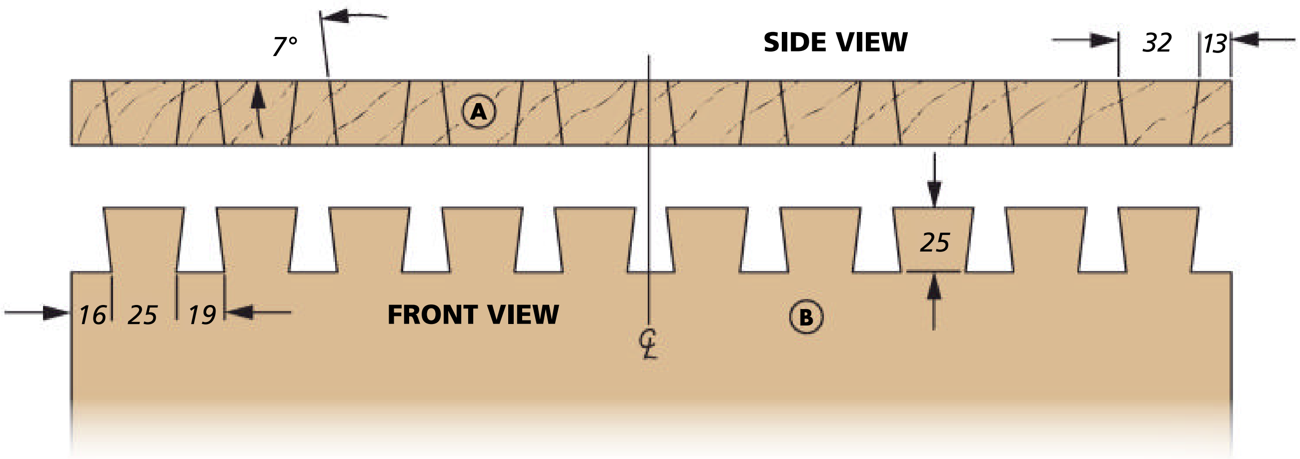
Australian Woodsmith
GO On-Line Extras
For more on how to make perfect hand cut dovetails, visit our website at australianwoodsmith.com.au

INTERNAL PARTS. Start off by cutting the vertical and horizontal dividers to size, along with the drawer partitions. Figure 1 on the next page shows how to make the tongues on these pieces. Now you can cut the stopped trenches (detail 'b' above) in the partitions and dividers, Figure 2 sheds some insight on this. Figure 3 shows how to do the stopped trenches in the sides and top. Take a moment and drill the holes for the shelf pin sleeves that you see in the main drawing above.

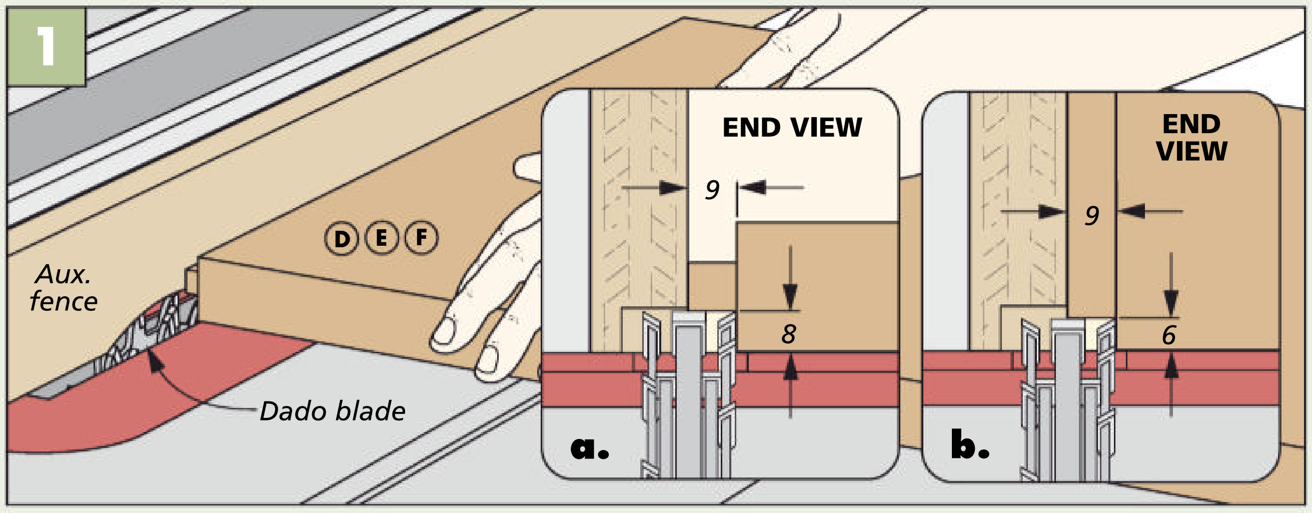
Cut the mortises in the top (detail 'd' above) and bottom for the pivot hinges. Figure 4 shows the bottom panel's mortise.

ASSEMBLE THE CASE. Slow set glue and extra hands that know what they're doing will help make the case go together smoothly. Assemble the top, sides, horizontal divider and bottom first. When the clamps are stowed, rout a rebate along the rear edge of the cabinet for the back that you'll install later.

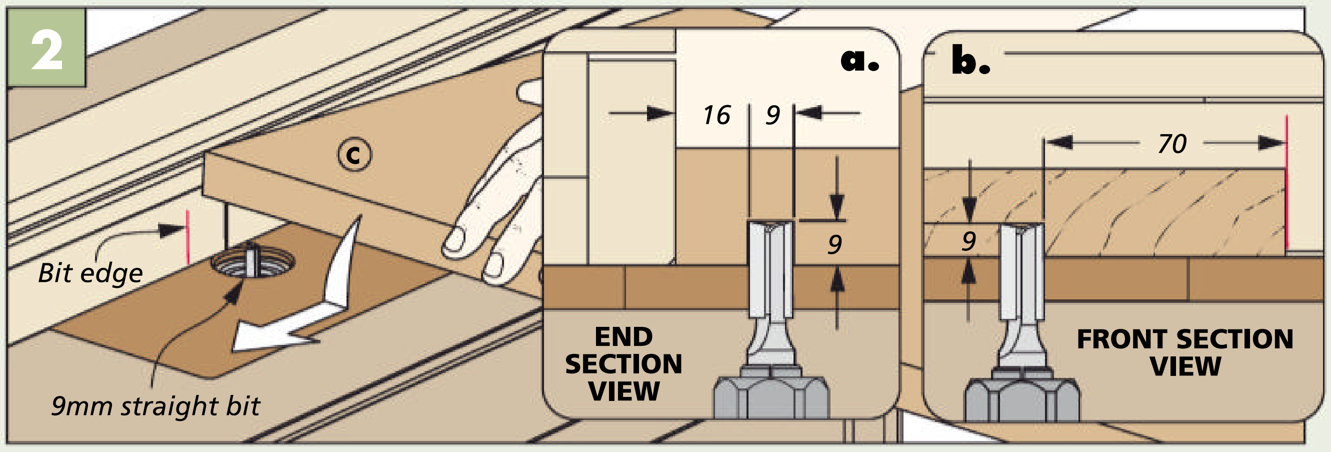
Now you can apply glue and slide the vertical divider and drawer partitions in place.


7°
SIDE VIEW
32
13
A
25
16
25
19
FRONT VIEW
B
℄

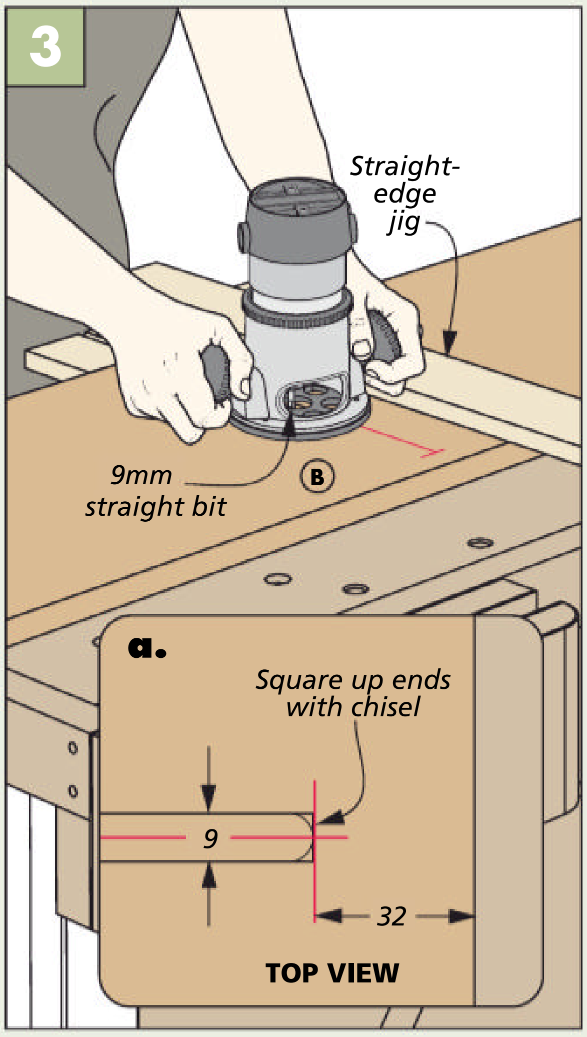
CASE JOINERY DETAILS


1
D E F
Aux. fence
Dado blade
END VIEW
9
8
a.
END VIEW
9
6
b.

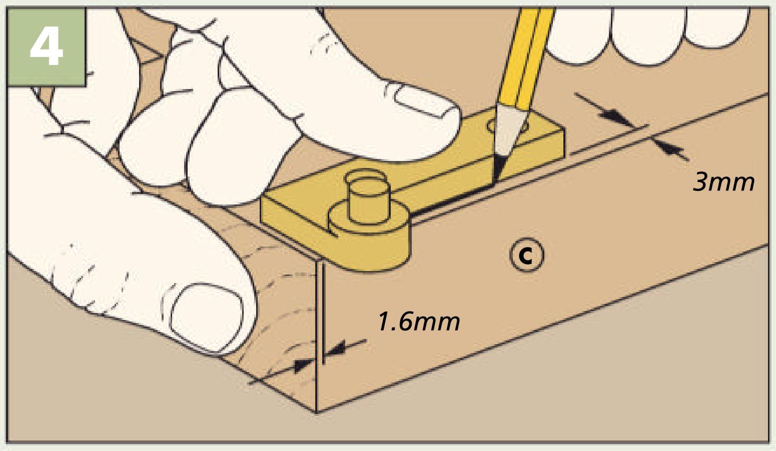
Tongues First. The tongues on the dividers and partitions are made at the table saw. Cut the shoulders with the boards supported by a mitre gauge and auxiliary fence (detail 'b').


2
C
Bit edge
9mm straight bit
a.
16
9
9
END SECTION VIEW
b.
70
9
FRONT SECTION VIEW

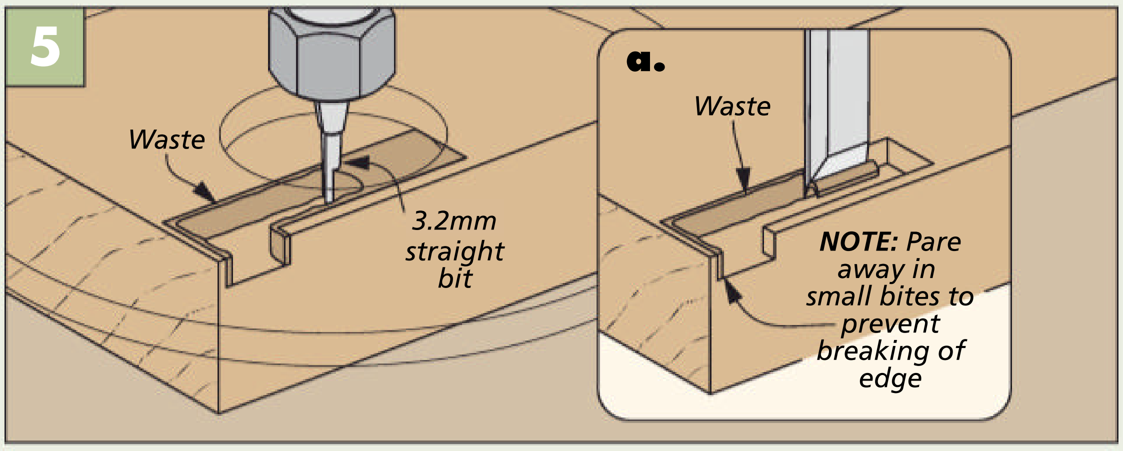
Stopped Trenches. The trenches for the partitions in the bottom and horizontal divider are stopped trenches. To dial in your plunge cut, mark the leading edge of the bit on the fence.


3
Straight-edge jig
9mm straight bit
B
a.
Square up ends with chisel
9
32
TOP VIEW

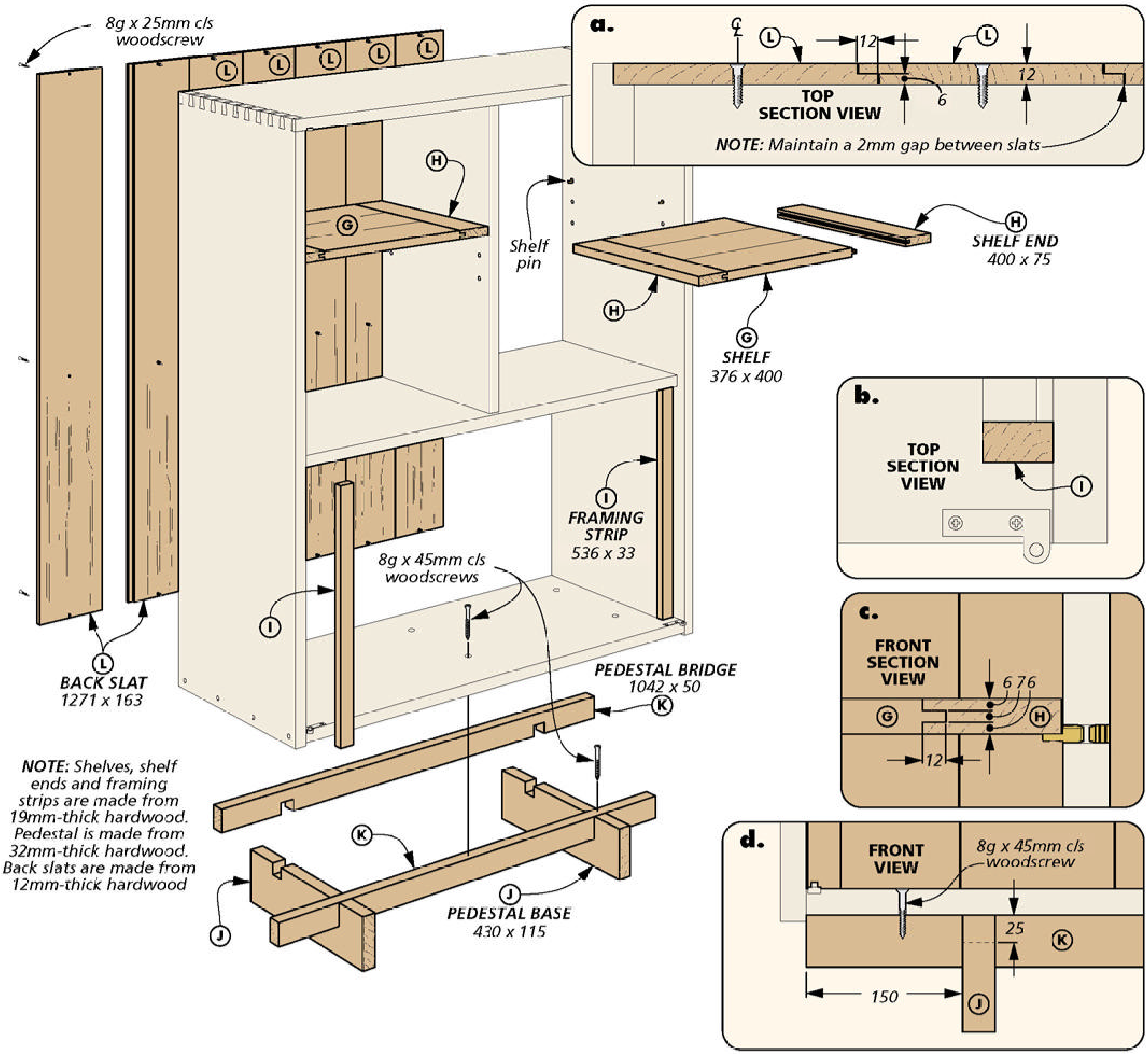
Trenches for Dividers. A jig guides your router when making the trenches for dividers.



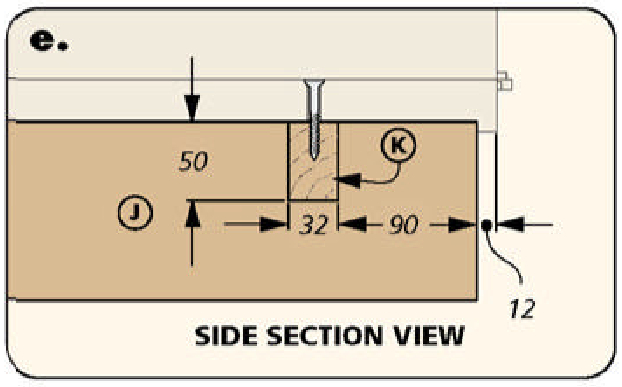
Trace the Hinge. Place the hinge on the bottom and trace its outline with a marking knife or pencil.


5
Waste
3.2mm straight bit
a.
Waste
NOTE: Pare away in small bites to prevent breaking of edge

Remove the Waste. A router and a small straight bit removes most of the waste. A chisel squares the corners and completes the job.


8g x 25mm c/s woodscrew
L
H
G
Shelf pin
H
G
SHELF 376 x 400
SHELF END 400 x 75
I
FRAMING STRIP 536 x 33
8g x 45mm c/s woodscrews
I
L
BACK SLAT 1271 x 163
PEDESTAL BRIDGE 1042 x 50
K
K
J
PEDESTAL BASE 430 x 115
J
NOTE: Shelves, shelf ends and framing strips are made from 19mm-thick hardwood. Pedestal is made from 32mm-thick hardwood. Back slats are made from 12mm-thick hardwood
a.
℄
12
12
6
TOP SECTION VIEW
NOTE: Maintain a 2mm gap between slats
b.
TOP SECTION VIEW
I
c.
FRONT SECTION VIEW
6 76
G
H
12
d.
FRONT VIEW
8g x 45mm c/s woodscrew
25
K
150
J

Next, the BACK, THE DRAWERS & MORE


e.
50
K
J
32
90
12
SIDE SECTION VIEW

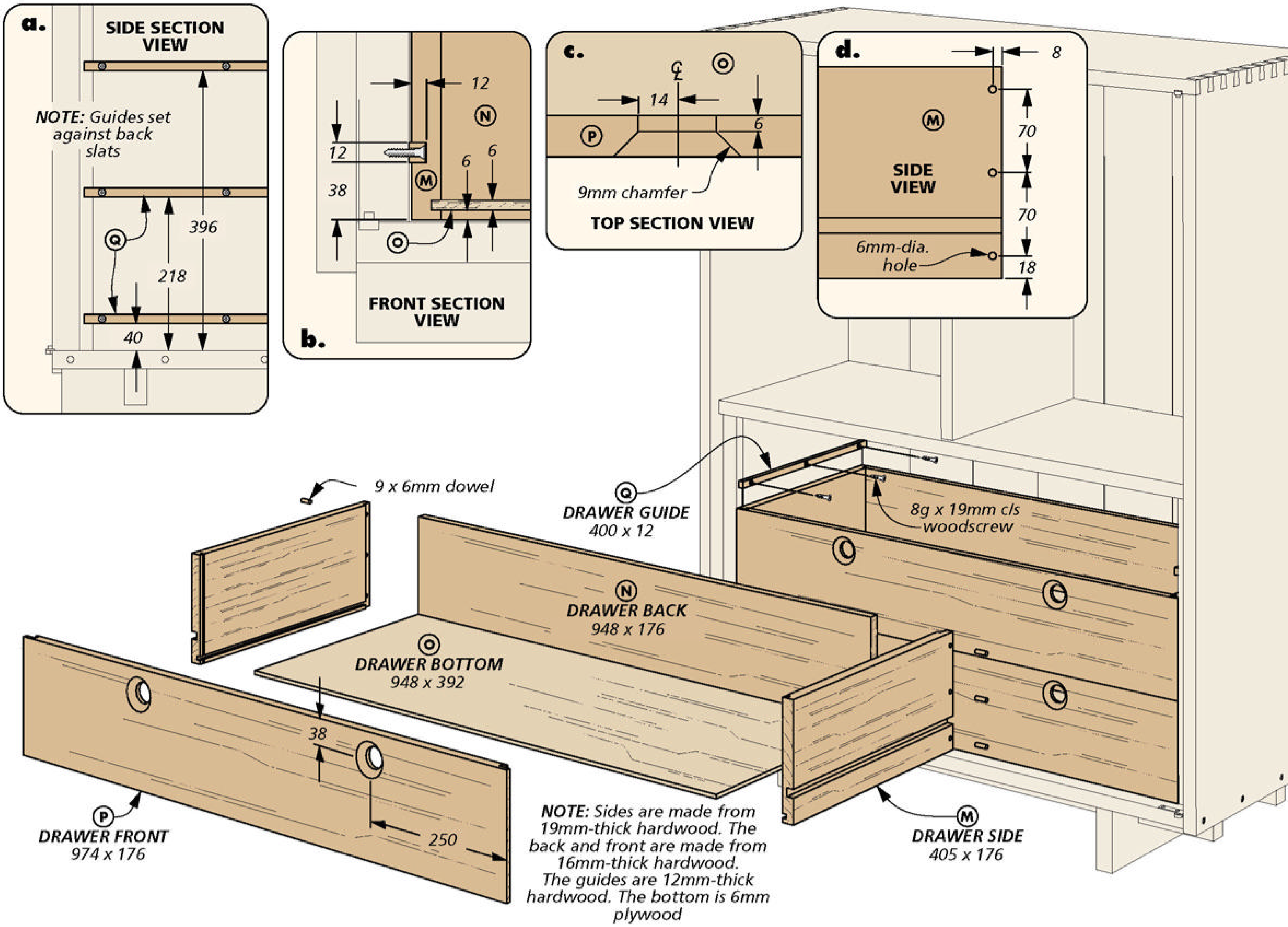
Building the case for this cabinet was definitely a workout. You'll be glad to know that all the heavy lifting you just finished required the most sweat equity — other than moving the cabinet to its final home, the heavy lifting is done. Some lighter fare is next, starting with the shelves.

SHELVES. The two shelves you see in the main drawing above and detail 'c' are panels with breadboard ends. After cutting the centred tongues in the shelves, cut the mating grooves in the ends. Both steps are done at the table saw. When clamping up the shelves, apply glue only in the centre of the grooves to allow for wood movement.

FRAMING STRIPS. The framing strips you see in detail 'b' are glued to the edges of the drawer partitions. They cover the gap between the sides and drawer partitions. Now that you've had some time to recoup doing some light work, let's step back into the heavy material for a moment and focus what the cabinet sits on — the pedestal.

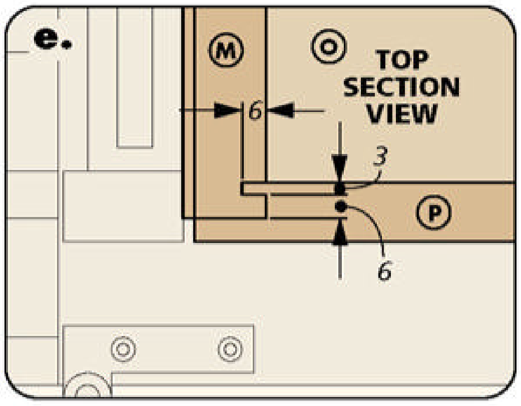
THE PEDESTAL. The pedestal of the cabinet scales nicely to the rest of the object. It lifts the cabinet off the ground for easy cleaning yet provides plenty of support. The wider base parts run from front to back and are centred on the cabinet. Detail 'e' lays out the notches in the base.

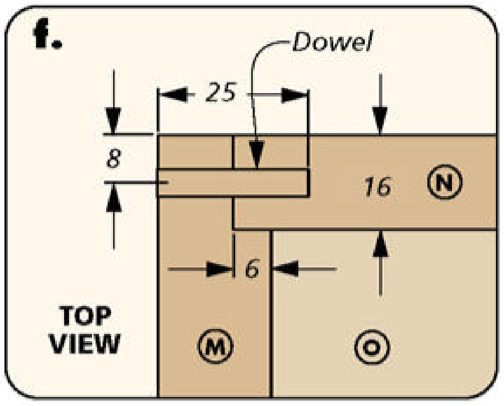
Meanwhile the bridge parts travel side to side and are trapped between the side panels. All four pieces are notched (at the table saw) so they'll set flush to each other. Detail 'd' shows the notch location and how the bridge pieces cantilever beyond the base pieces. Once you've screwed the bridges to the bases, screw the assembly to the bottom of the cabinet (detail 'd').


a.
SIDE SECTION VIEW
NOTE: Guides set against back slats
Q
396
218
40
b.
FRONT SECTION VIEW
12
N
12
6
6
38
M
O
c.
℄
O
14
6
P
9mm chamfer
TOP SECTION VIEW
d.
8
M
70
SIDE VIEW
70
6mm-dia. hole
18
9 x 6mm dowel
Q
DRAWER GUIDE
400 x 12
8g x 19mm c/s woodscrew
N
DRAWER BACK
948 x 176
O
DRAWER BOTTOM
948 x 392
38
P
DRAWER FRONT
974 x 176
250
M
DRAWER SIDE
405 x 176

NOTE: Sides are made from 19mm-thick hardwood. The back and front are made from 16mm-thick hardwood. The guides are 12mm-thick hardwood. The bottom is 6mm plywood

THE BACK. The back slats have a shiplap joint that allows the boards to expand and contract. First cut double rebates in all the pieces but the ends (detail 'a' on the previous page). Screw them in the centre to the case and horizontal divider. The drawers are next on the agenda.


e.
M
O
TOP SECTION VIEW
6
3
P
6


f.
Dowel
25
8
16
N
6
TOP VIEW
M
O

DRAWERS

It won't come as a shock to you, but as you see above these drawers are generously sized. Note that the sides are thicker than the front and back of the drawer. This adds some rigidity to these large drawers.

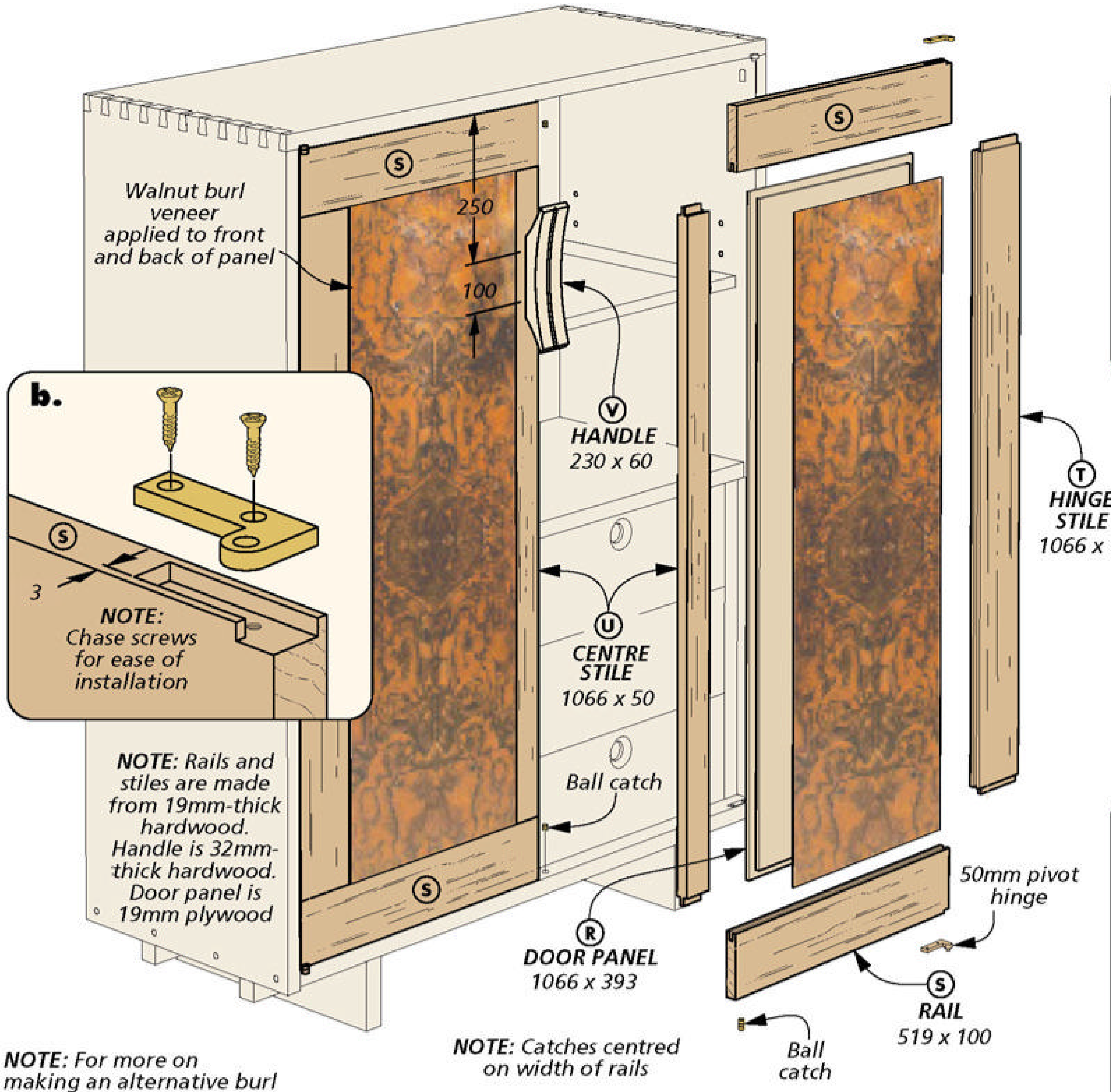
Start by milling all the pieces to size, then install your dado blade in the table saw. I started by making the rebates in the back of the drawer sides (detail 'f'). Follow that up with changing the dado set-up and cut the grooves in the sides for the guides (detail 'b'). Then change the blade and make all the grooves in the drawer parts for the plywood bottoms.

The last dado set-up is used to make the initial cut for the locking rebate on the drawer front that you see in detail 'e.' Then trim the narrow lip on the back to make a tongue for the trench you'll cut next in the side.

DRAWER PULLS. There are no drawer pulls. As shown in the main drawing above, there are two finger holes in the front. After you've drilled the holes, use a chamfer bit to flare out the opening (detail 'c').

Now you can glue up the drawer. When the clamps come off, drill the holes for the dowels that pin the sides to the back (details 'd' and 'f'). To add a little more strength to the drawer they're held in place with epoxy. You can sand the dowels flush after the epoxy cures.

INSTALL THE DRAWERS. Cut the drawer guides to length and drill holes for the mounting screws. Detail 'a' shows their location in the cabinet. Now it's time to make some doors.

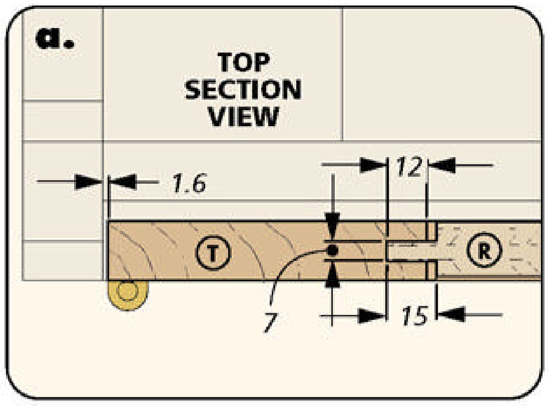

Walnut burl veneer applied to front and back of panel
250
100
S
V
HANDLE
230 x 60
U
CENTRE STILE
1066 x 50
Ball catch
T
HINGE STILE
1066 x 100
R
DOOR PANEL
1066 x 393
50mm pivot hinge
S
RAIL
519 x 100
Ball catch
b.
S
3

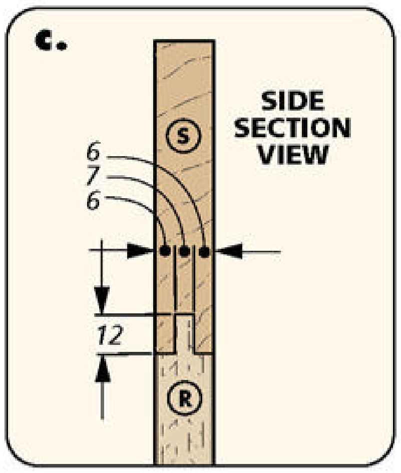
NOTE: Chase screws for ease of installation

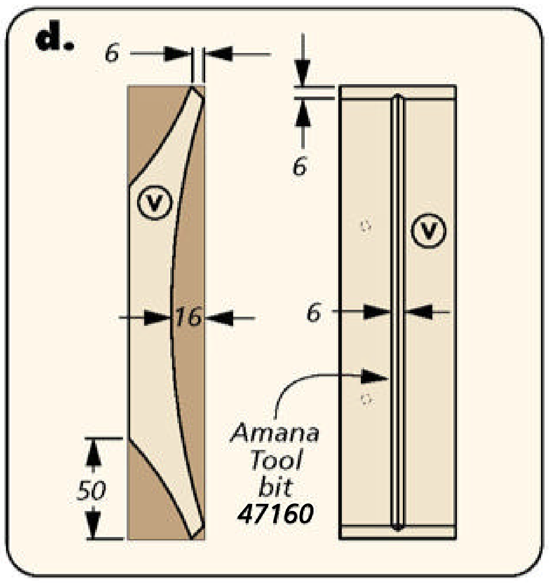
NOTE: Rails and stiles are made from 19mm-thick hardwood. Handle is 32mm-thick hardwood. Door panel is 19mm plywood

NOTE: Catches centred on width of rails

NOTE: For more on making an alternative burl handle, turn to page 72


a.
TOP SECTION VIEW
1.6
12
T
R
7
15

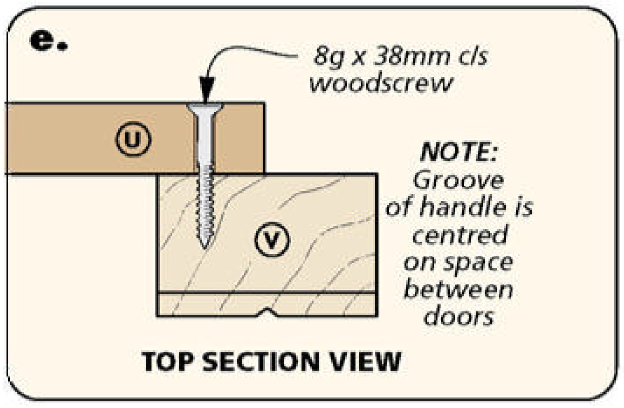

c.
SIDE SECTION VIEW
S
6
7
6
12
R


d.
6
6
V
16
6
V
50
Amana Tool bit 47160

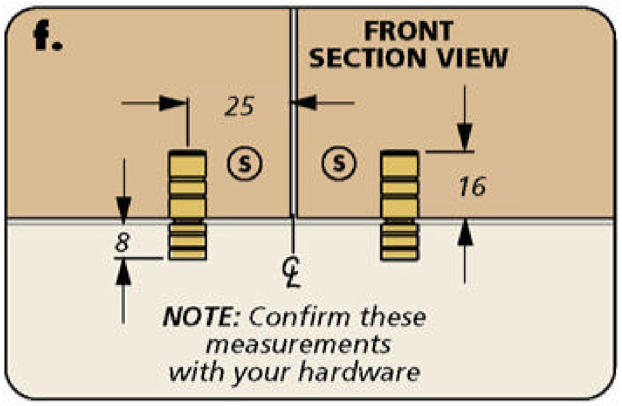
Finish with a fine pair of DOORS

You're at the final chapter of the Bahut cabinet, all that's left to do is make and hang these good-looking doors. As you see in the drawing above, the panels are made of quality plywood with a walnut (or blackwood) veneer. Let's start by making these panels.

DOOR PANELS. First, cut to size the plywood panels. To apply the burl veneer (paper backed if you can) our workshop craftsman Steve Johnson used a vacuum press. He said it could be done with contact cement instead since it's paper backed. Either way, afterwards you'll need to cut a centred tongue on all the edges of the panels. As you can see on page 45, in keeping with the Japanese concept of kodama, you could complement the walnut burl veneer with a door handle made of a contrasting section of solid maple. Turn to page 72 to read up on this option.


e.
8g x 38mm c/s woodscrew
U
V
TOP SECTION VIEW

NOTE: Groove of handle is centred on space between doors


f.
FRONT SECTION VIEW
25
S
S
16
8
℄

NOTE: Confirm these measurements with your hardware

TONGUES. Notice in detail 'c' that the tongues for the rails are narrower than the tongues for the stiles (detail 'a'). This creates the vertical shadow line between the panel and the stiles that I mentioned in the beginning. Before assembly, you'll need to paint the reveal of the vertical tongues black. Now it's time to make the rails and stiles.

RAILS & STILES. Notice that the stiles are trapped between the rails. To me, this detail makes the doors appear a little wider. After you've cut the centred grooves in the rails and stiles at the table saw, you can glue up the two doors.

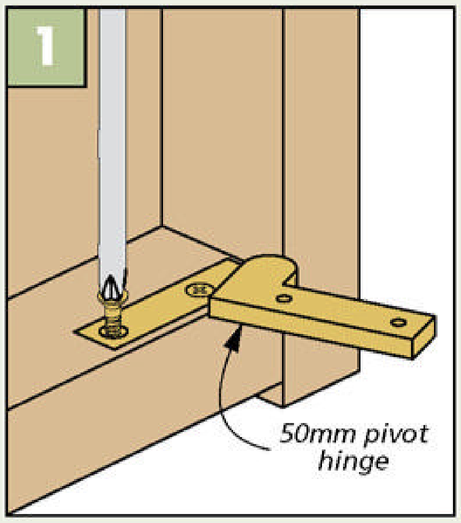
FITTING THE DOORS. Detail 'a' shows the ideal reveal that you want to create between the doors and the cabinet. Use thin shims to test fit the doors in the opening and plane the edges as needed.

Detail 'b' shows the mortises in the top and bottom rails for the pivot hinges. Detail 'b' also shows the trick of drilling the pilot holes and installing the screws temporarily. This will make following the directions in Figure 2 in the box to the right much easier.

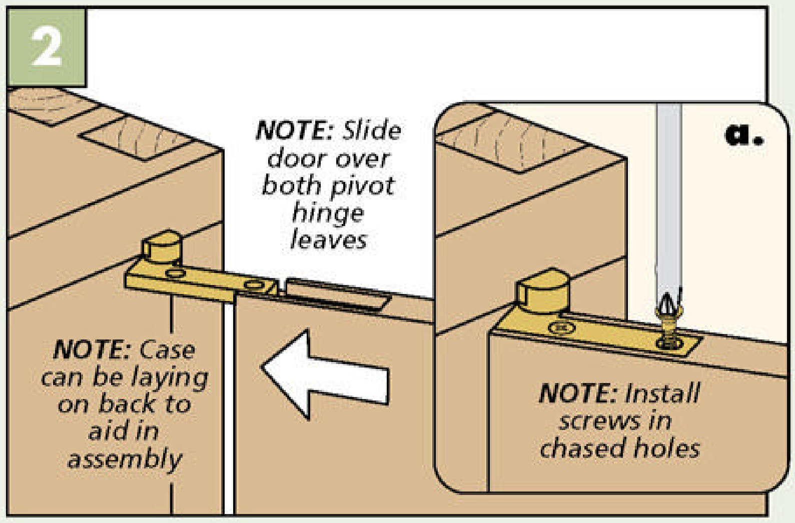
There are a couple of things left to do. Install the ball catches (detail ‘f’). Make the handle that screws to the door on the left side of the cabinet (detail ‘d’ and ‘e’).

Now you can apply the finish. Two coats of Wipe-On-Poly and a rub down with beeswax is all you need to protect this beautiful object — you’ll want to let that walnut glow. W

HINGE MOUNTING


1
50mm pivot hinge

The Hinge. Screw the hinges into the mortises on the case.

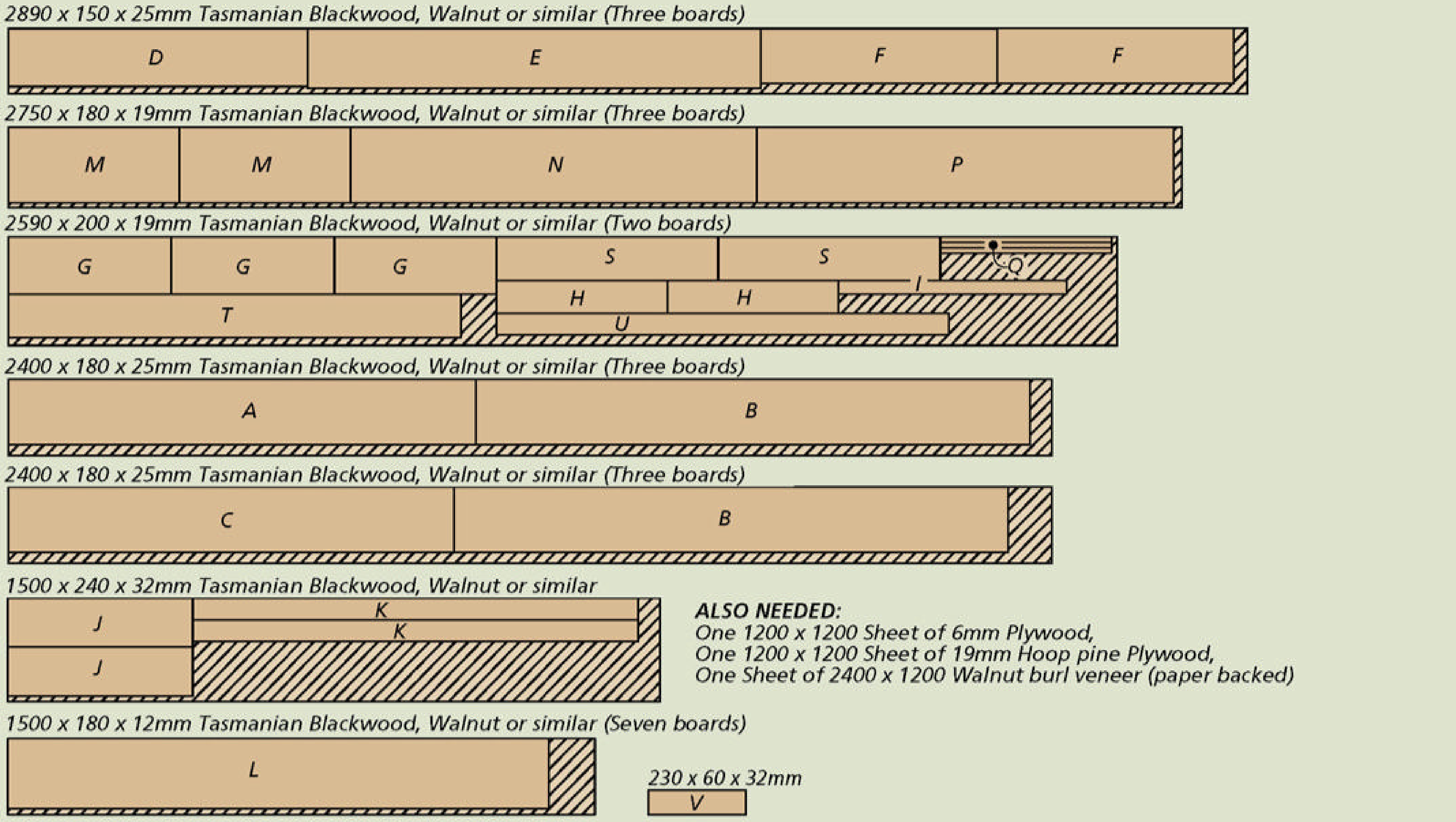

2
NOTE: Slide door over both pivot hinge leaves
a.
NOTE: Case can be laying on back to aid in assembly
NOTE: Install screws in chased holes

Attach the Doors. With the help of a friend, slide the doors onto the hinges and screw them in place.

Materials, Supplies & Cutting Diagram

A	Top (1)	1092 x 462 x 25	**L**	Back Slats (7)	1271 x 163 x 12
B	Sides (2)	1295 x 462 x 25	**M**	Drawer Sides (6)	405 x 176 x 19
C	Bottom (1)	1042 x 462	**N**	Drawer Backs (3)	948 x 176 x 16
D	Vertical Divider (1)	696 x 408 x 25	**O**	Drawer Bottoms (3)	948 x 392 x 6ply
E	Horzontal Divider (1)	1060 x 425	**P**	Drawer Fronts (3)	974 x 176 x 16
F	Drawer Partitions (2)	554 x 394 x 25	**Q**	Drawer Guides (6)	400 x 12 x 11
G	Shelves (2)	376 x 400 x 19	**R**	Door Panels (2)	1066 x 393 x 19ply
H	Shelf Ends (4)	400 x 75 x 19	**S**	Rails (4)	519 x 100 x 19
I	Framing Strips (2)	536 x 33 x 19	**T**	Hinge Stiles (2)	1066 x 100 x 19
J	Pedestal Base (2)	430 x 115 x 32	**U**	Centre Stiles (2)	1066 x 50 x 19
K	Pedestal Bridge (2)	1042 x 50 x 32	**V**	Handle (1)	230 x 60 x 32

- (10) 8g x 38mm c/s Woodscrews
- (8) 9mm-dia x 10mm Walnut Dowel
- (24) Shelf Pin Sleeves
- (8) Shelf Pins
- (10) 8g x 45mm c/s Woodscrews
- (18) 8g x 19mm c/s Woodscrews
- (21) 8g x 25mm c/s Woodscrews
- (18) 6mm-dia x 25mm Walnut Dowel
- (4) 50mm Pivot Hinges
- (4) 9mm dia. Ball Catch


2890 x 150 x 25mm Tasmanian Blackwood, Walnut or similar (Three boards)
D
E
F
F
2750 x 180 x 19mm Tasmanian Blackwood, Walnut or similar (Three boards)
M
M
N
P
2590 x 200 x 19mm Tasmanian Blackwood, Walnut or similar (Two boards)
G
G
G
S
S
Q
I
T
H
H
U
2400 x 180 x 25mm Tasmanian Blackwood, Walnut or similar (Three boards)
A
B
2400 x 180 x 25mm Tasmanian Blackwood, Walnut or similar (Three boards)
C
B
1500 x 240 x 32mm Tasmanian Blackwood, Walnut or similar
J
K
K
J
1500 x 180 x 12mm Tasmanian Blackwood, Walnut or similar (Seven boards)
L
230 x 60 x 32mm
V

ALSO NEEDED:
One 1200 x 1200 Sheet of 6mm Plywood,
One 1200 x 1200 Sheet of 19mm Hoop pine Plywood,
One Sheet of 2400 x 1200 Walnut burl veneer (paper backed)

Router Table

This project makes the case that workshop machines should work hard and look great, too.

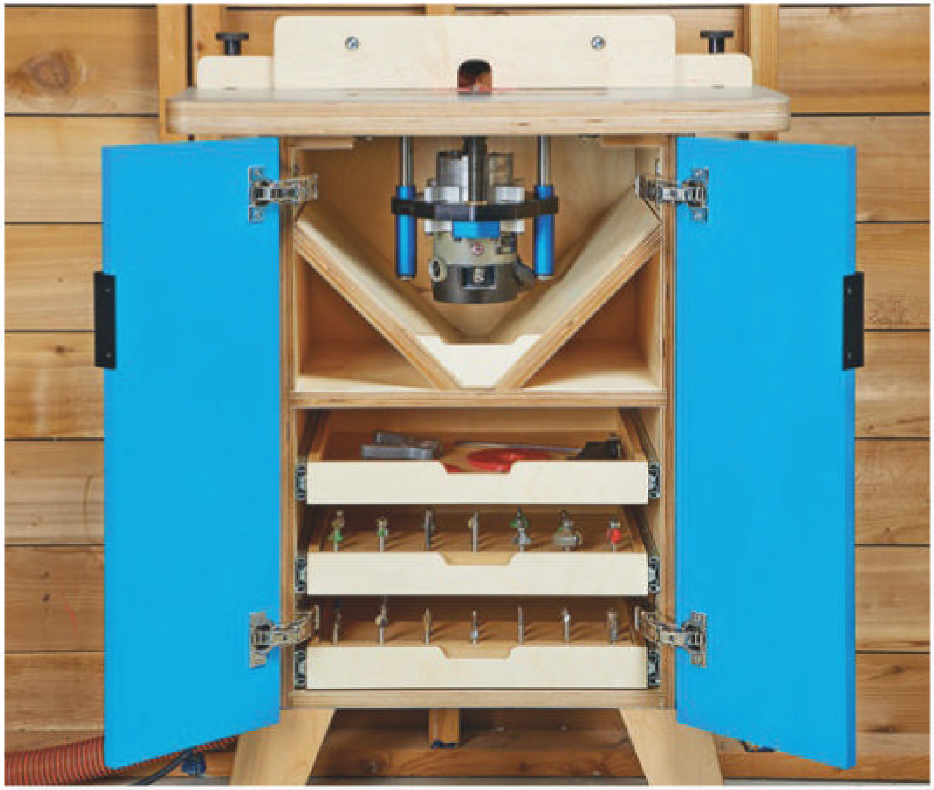
The siren call of professional-grade gear is tough to block out for home woodworking. Router tables offer a good example. In the past few years, the trend has followed the "bigger is better" line. Even with mobile bases, these continent-sized tools take up significant space in a small workshop.

My build-it-yourself approach has several payoffs. In the case of this router table it's to nestle into a sweet spot for size. The 660 x 460 top is sized for the kind of projects you're likely to encounter in *Austalian Woodsmith*.

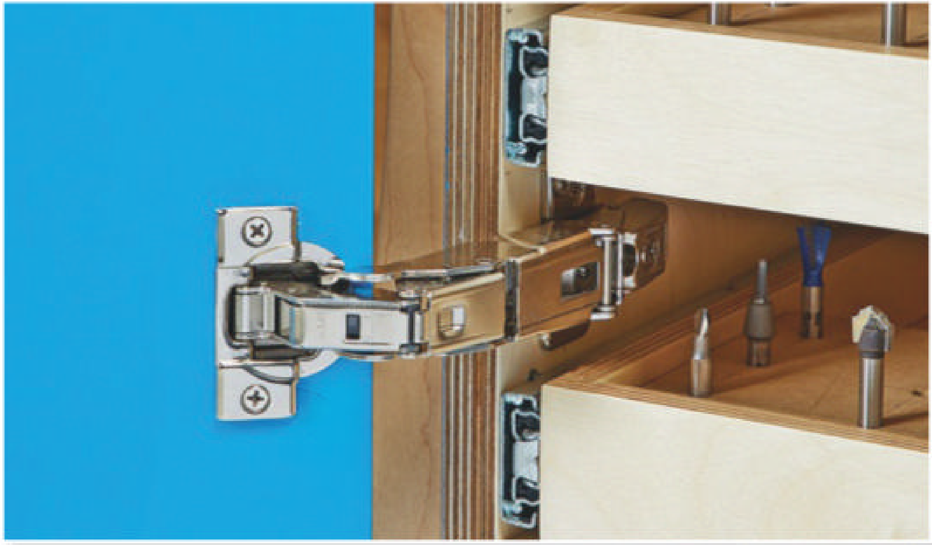
The Hoop pine plywood and plastic laminate that make up the top provide high performance. We used a Kreg plate and lift system that makes bit changes and adjustments easy and accurate.

CABINET BASE. Down below, the cabinet is a triple threat. Enclosing the router dampens the sound. It also contains dust and chips. Finally, the case offers storage for all the things that go with routing: spanners, insert rings, bits, bearings, set-up gauges ... the list goes on.

GOOD LOOKS. Workshop projects, whether commercially made or hand built, feature a pragmatic, utilitarian design aesthetic (read boxy and boring). I want my workshop to exhibit the same creativity that I like to express in my other projects. The flared legs amp up the visual appeal without clogging the construction process.

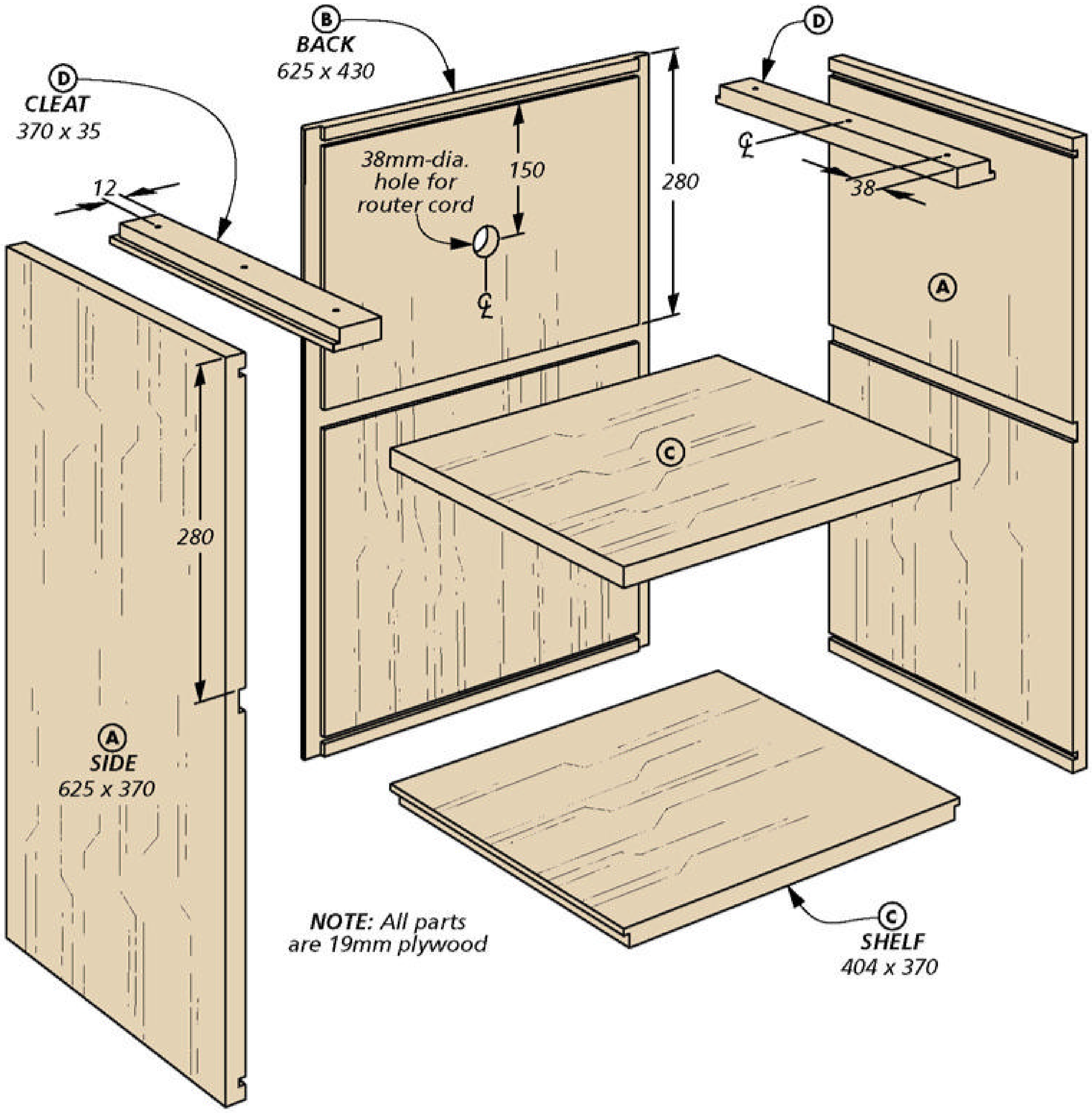


▲ The cabinet houses a slide-out hopper that collects dust and chips for easy disposal. Three drawers on full-extension slides corral all your router-related gear, keeping it dust free.



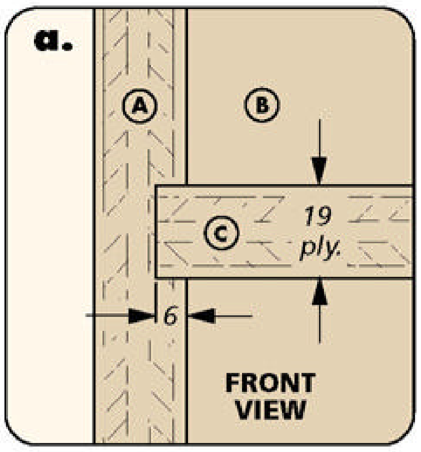
▲ European-style, soft-close hinges open wide for full access to the dust bin and the drawers. While not strictly necessary, a paint job elevates the look of the project and your workshop space.

▲ Often overlooked, a solid fence is a critical part of a router table. A stout hardwood beam adjusts easily and has dust collection built in. The front face can be customised to suit the task at hand.

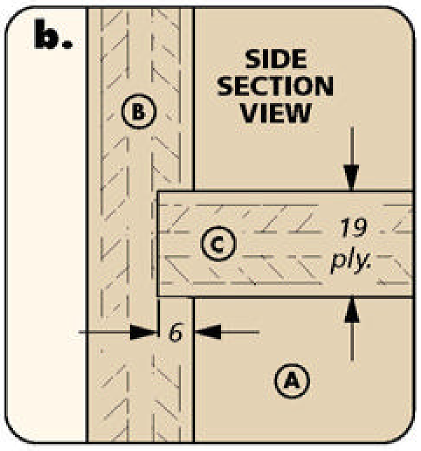

D
CLEAT
370 x 35
12
B
BACK
625 x 430
38mm-dia.
hole for
router cord
150
℄
280
D
℄
38
A
C
280
A
SIDE
625 x 370
C
SHELF
404 x 370

NOTE: All parts are 19mm plywood

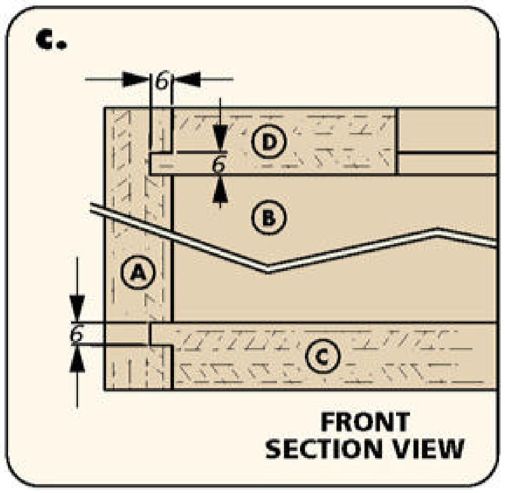
a.


A
B
C
19
ply.
6
FRONT
VIEW

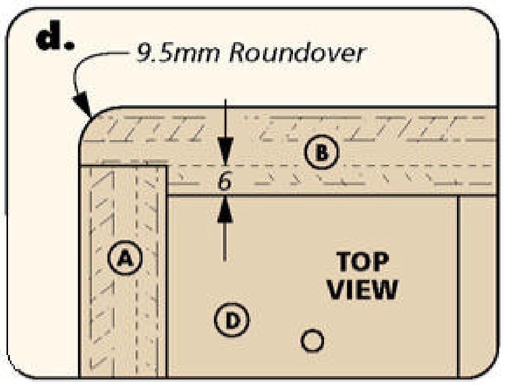
b.


SIDE
SECTION
VIEW
B
C
19
ply.
6
A

c.


6
D
6
B
A
6
C
FRONT
SECTION VIEW

d.


9.5mm Roundover
B
6
A
TOP
VIEW
D

Cabinet comes **FIRST**

The centre of gravity on this project is the plywood case. It supports the top and is the structure the legs are attached to. The "normal" approach to casework like this is to use thick plywood on the sides and a thin back panel. The drawing above shows a more robust method.

The sides and back are all 19mm plywood. Using a thick back panel allows you to cut joinery into the three pieces for a stronger connection, with the two shelves and the cleats up top.

JOINERY. Let's take a closer look at the joinery. With plywood, simple solutions work best. At each end of the sides and back, a narrow trench holds the bottom shelf and the cleats. This is shown in detail 'c.' The location of the far end of the trenches on the sides and back matches the thickness of the mating plywood pieces. So why narrow trenches and not rebates? Trenches allow the shelf and cleats to lock into position positively.

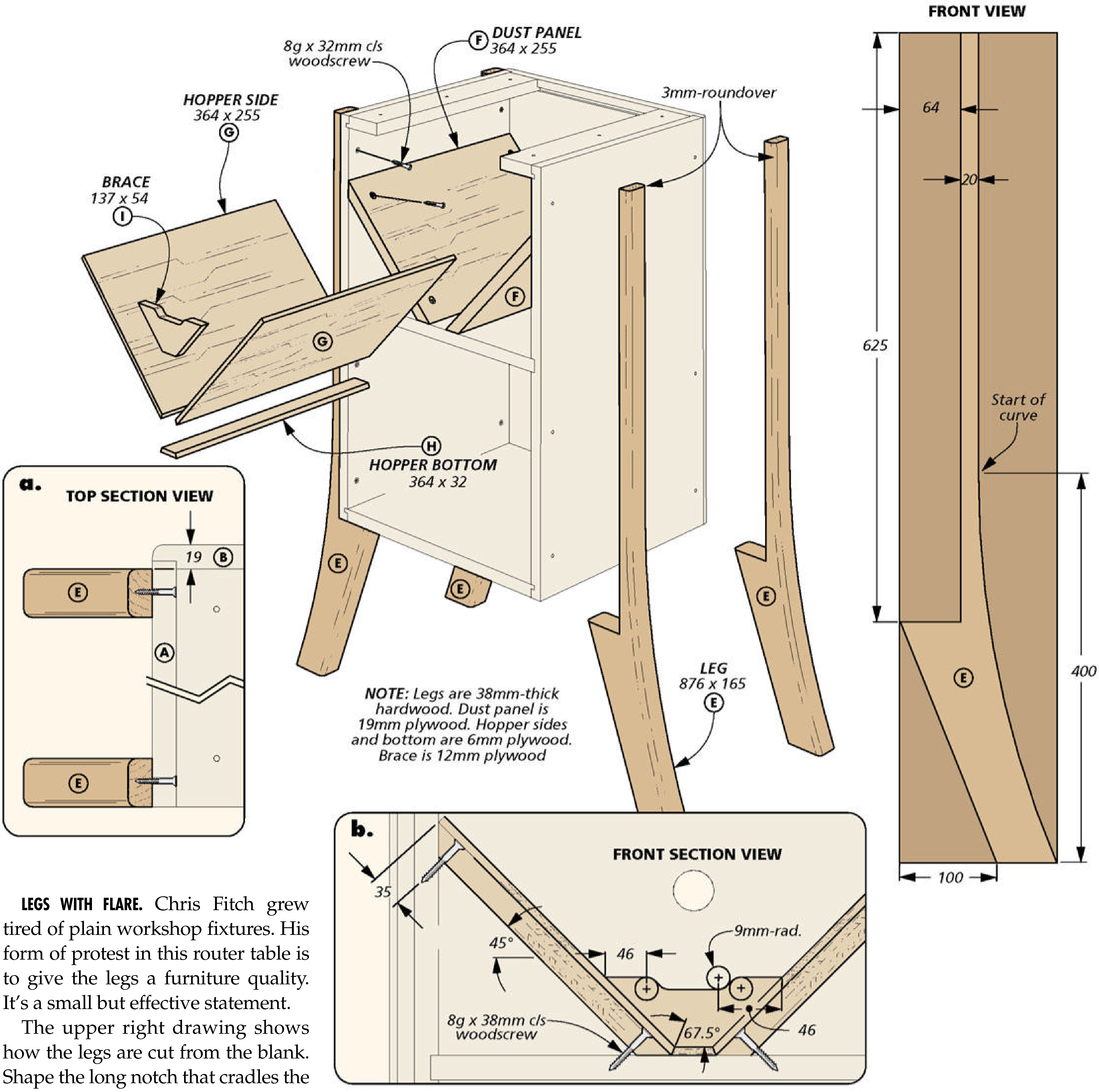
The middle shelf is held in a trench that's sized to match its thickness exactly, as in details 'a' and 'b.' The final bit of joinery is to cut a rebate along each edge of the back to index the case sides. You can see that in detail 'd.' Then drill a hole for the router's power cord.

ASSEMBLY. Take a moment here to glue up the case. The back, sides and two shelves are best glued up in one go. The smaller cleats can be slipped into place once the clamps are on.

ROUNDOVER. Detail 'd' above shows the final step to take care of on the case. A sprinkling of roundovers on this project adds a little style, as well as softens the harsh edges. If you'll be painting the case, as we did, now is a good time to start the priming and painting process.

LEGS & DUST CONTROL

A completed case forms the basis for the remaining parts of the project. Working out from the case, you can make the legs. Then work inward to create a very simple dust control system.


8g x 32mm c/s woodscrew
F DUST PANEL 364 x 255
HOPPER SIDE 364 x 255 G
BRACE 137 x 54 I
3mm-roundover
G
F
H HOPPER BOTTOM 364 x 32
E
E
E
LEG 876 x 165 E
NOTE: Legs are 38mm-thick hardwood. Dust panel is 19mm plywood. Hopper sides and bottom are 6mm plywood. Brace is 12mm plywood
FRONT VIEW
64
20
625
Start of curve
400
E
100
a. TOP SECTION VIEW
19 B
E
A
E
b. FRONT SECTION VIEW
35
45°
46
9mm-rad.
8g x 38mm c/s woodscrew
67.5°
46

LEGS WITH FLARE. Chris Fitch grew tired of plain workshop fixtures. His form of protest in this router table is to give the legs a furniture quality. It's a small but effective statement.

The upper right drawing shows how the legs are cut from the blank. Shape the long notch that cradles the case first. I cut the bottom of the notch at the table saw. A bandsaw and rip fence handle the long side.

Stay at the bandsaw to cut the curves. I cut one leg then used that as a template to form the others. The outer edges of the legs have roundovers and are secured to the case with screws, as you can see in detail 'a.'

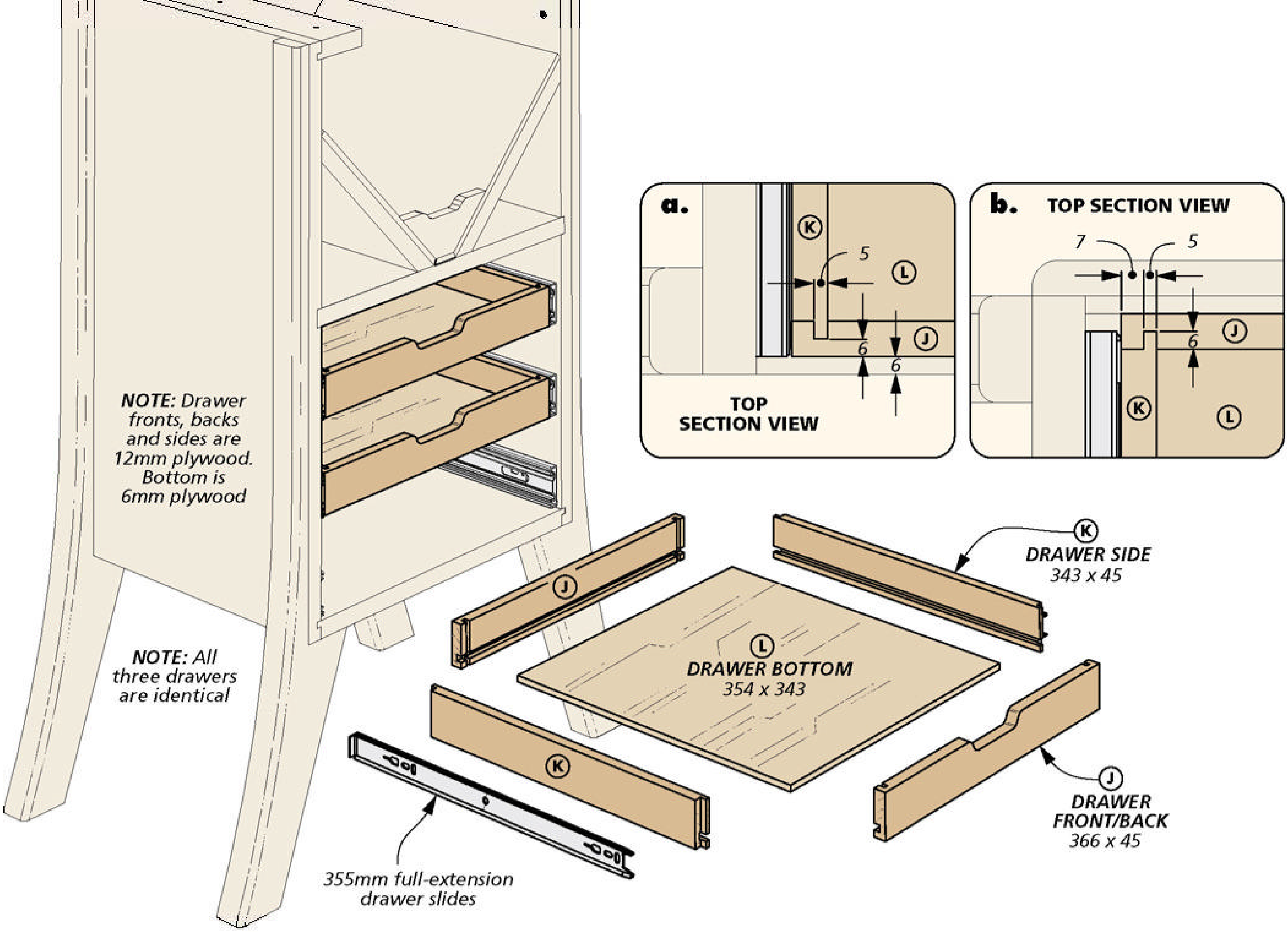
DUST HOPPER. A surprising pile of chips end up inside of a router table cabinet. To make clean-up easier, there's a two-part system. The first part consists of a pair of angled panels that are screwed to the inside of the case (detail 'b'). Bevelled edges on the panels seat against the case sides and shelf.

On top of these rests a lightweight, removable hopper. The angled sides gather and funnel the dust and chips so you can dump them out.

Installing the dust panels allows you to accurately size the components for the hopper. Take a moment to study detail 'b' to pick out the various angles you need to cut along the hopper sides and bottom piece.

A pair of braces create a front and back for the hopper and provide added strength, since the other parts are thin plywood.

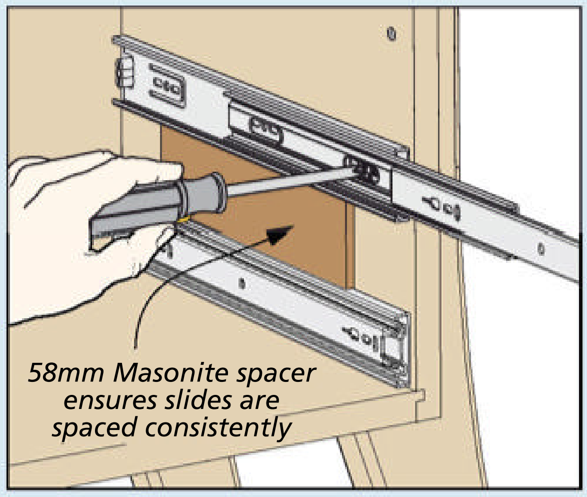
For full-sized leg and brace patterns, visit our website at **australianwoodsmith.com.au**


NOTE: Drawer fronts, backs and sides are 12mm plywood. Bottom is 6mm plywood
NOTE: All three drawers are identical
a.
K
5
L
6
J
6
TOP SECTION VIEW
b.
TOP SECTION VIEW
7
5
J
6
K
L
K
DRAWER SIDE
343 x 45
J
L
DRAWER BOTTOM
354 x 343
K
J
DRAWER FRONT/BACK
366 x 45
355mm full-extension drawer slides

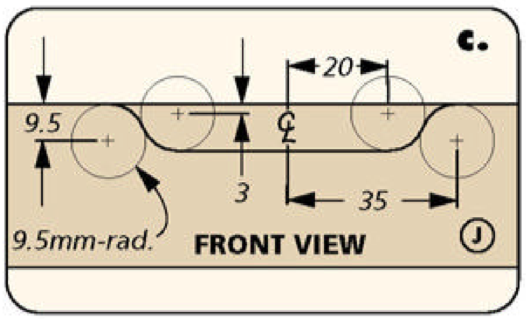
Corralling the **GEAR**

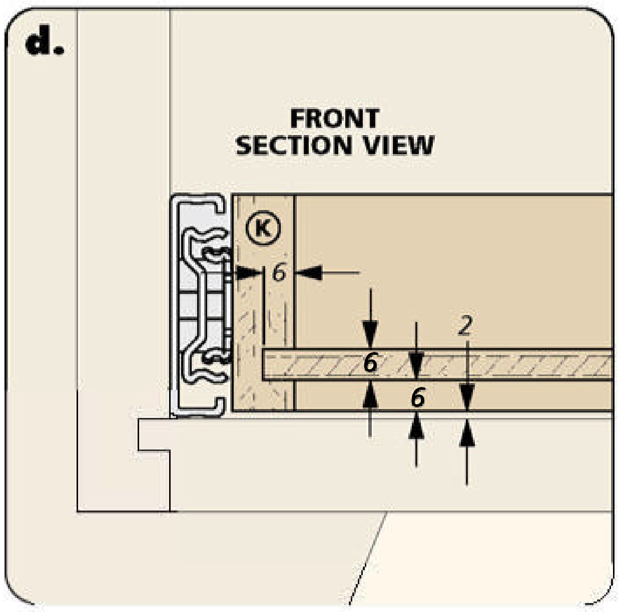
The compartment below the dust hopper could easily be left as is. For me, that would be a huge problem. Unorganised space like that is a warehouse, spacious but easily descends into chaos. The drawers shown here transform that same space into a library — organised and serene.

DRAWER SLIDE SPACERS


58mm Masonite spacer ensures slides are spaced consistently

Consistency. One drawer is flush with the bottom of the case. Space the others off it.


c.
20
9.5
℄
3
35
9.5mm-rad.
FRONT VIEW
J


d.
FRONT SECTION VIEW
K
6
2
6
6

For simplicity, all three drawers are the same size. And I kept them shallow. This eliminates deep, dark recesses where the bit you're looking for likes to hide.

TONGUE & GROOVE. The drawer box pieces are made from 12mm plywood. The parts and joinery are sized to leave a 12.7mm gap on each side for the drawer slides. Speaking of, the joinery on the drawers is tongue and groove. The details are shown in details 'a' and 'b' above.

A groove is cut on the fronts and backs. An interlocking tongue is then formed to fit on the sides. This is easily done at the table saw. Check out detail 'd' for the location of the groove cut in all the parts that holds the bottom.

INTEGRATED PULL. The drawers are covered by doors we'll get to in a bit. So I didn't want pulls that protruded from the front. Instead, I opted for the subtle cutout you can see in detail 'c.' I like using a Forstner bit to create the inner radii. The connecting cuts can be taken care of at the bandsaw.

After assembly, the drawers can be installed using full-extension slides. These come in two parts: a cabinet part and a drawer part. The drawing above shows the drawers evenly spaced in their compartment. But that's only one option. You can create any spacing to suit the items you plan on stashing inside.

The key to successful installation is making sure each side is level. The box on the bottom of this page highlights a trusted solution.

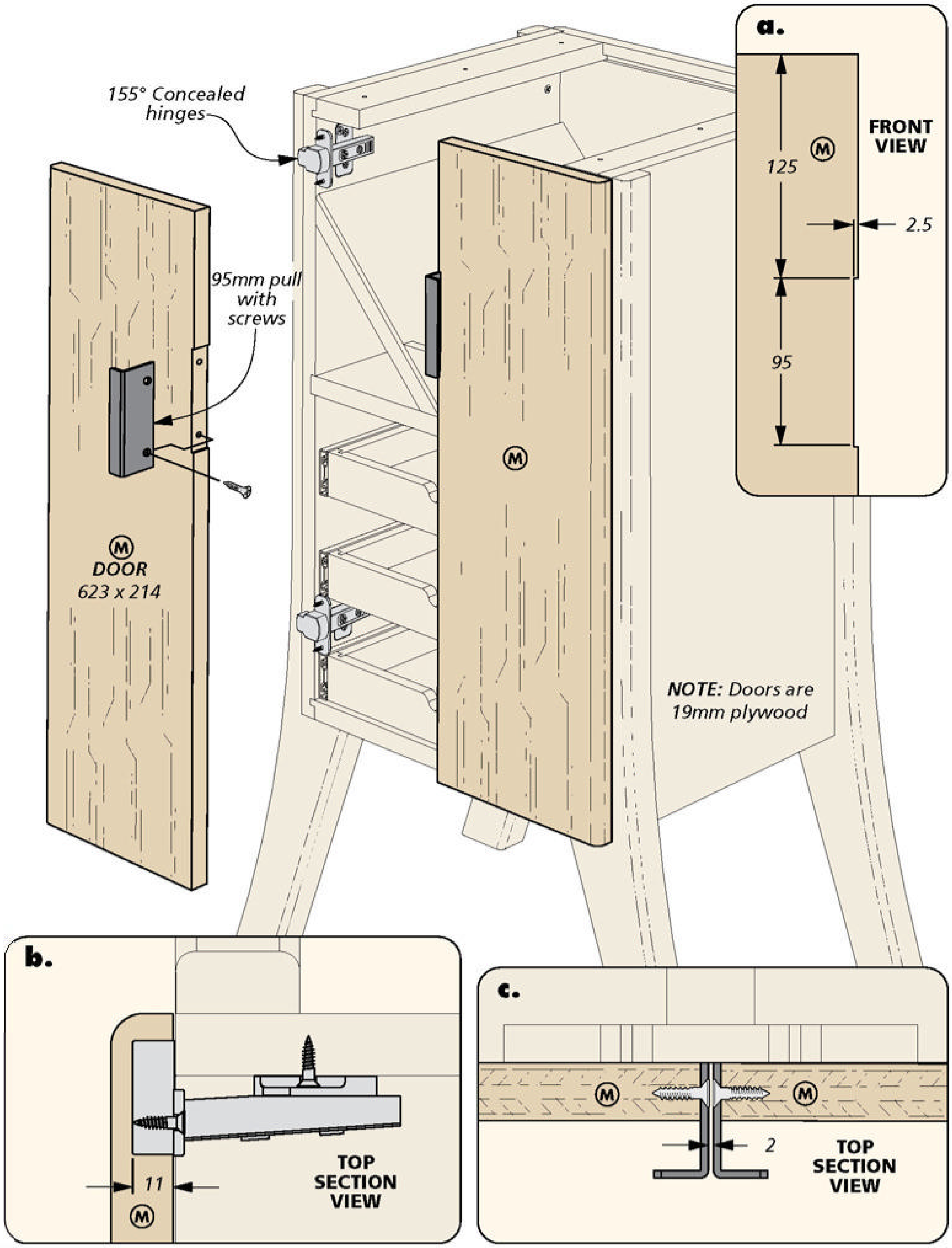
THE EASIEST DOORS

On a lot of projects, the doors can be mini-projects in themselves. But that doesn't have to always be the case. Here, plain plywood slabs do the job nicely and fit in well with the overall design motif of the project.

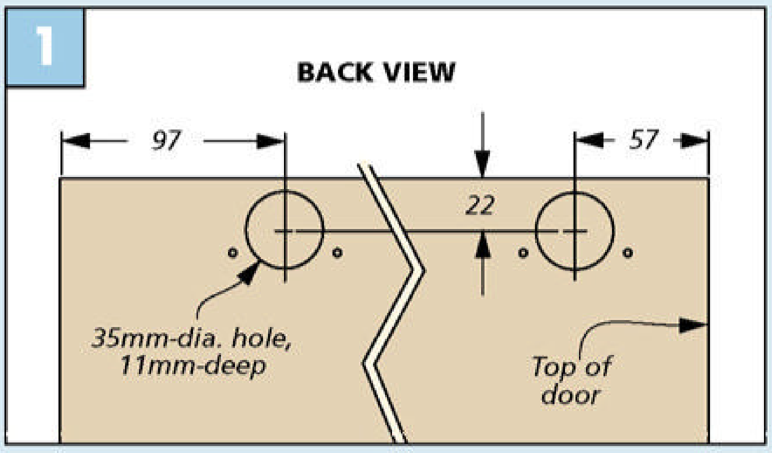
Each door is cut a hair shorter than the overall height of the cabinet. This creates clearance so the door won't bind against the top. Width-wise, size the doors for a small gap in the middle and the doors flush with the edges of the case. Check out details 'b' and 'c' at right.

DETAILS. Now for some finer details. The outside edge of each door gets a roundover to match the one at the back of the case. Along the inside edge, cut out a shallow mortise for a pair of trim edge pulls (detail 'a').

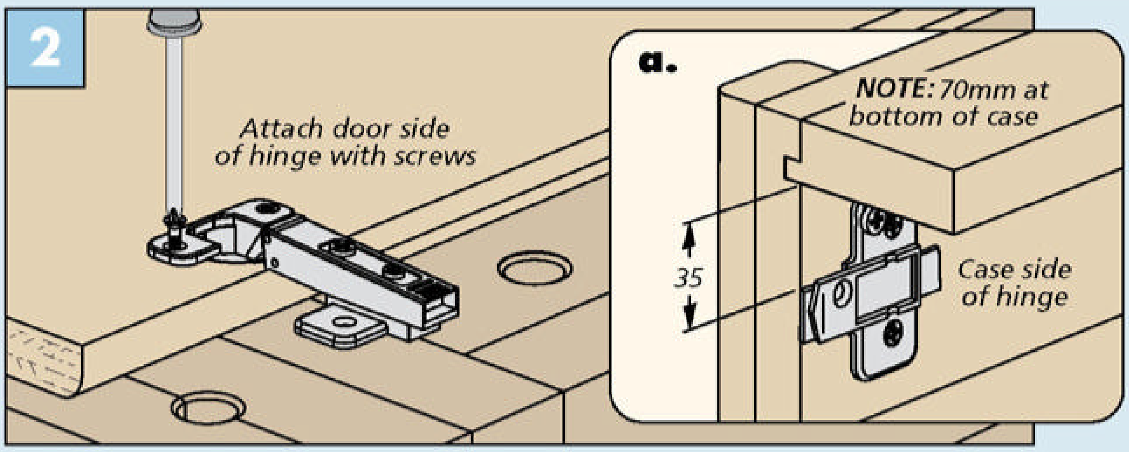
CONCEALED HINGES. The doors hang on concealed hinges that open wide enough to allow the drawer to open without scraping. Detail 'b' at right and the box below show you what you need to know. You'll drill holes in the doors for the hinge cup and attach the case side of the hinge with screws.


155° Concealed hinges
95mm pull with screws
M
DOOR 623 x 214
M
NOTE: Doors are 19mm plywood
a.
FRONT VIEW
125
M
2.5
95
b.
11
M
TOP SECTION VIEW
c.
M
M
2
TOP SECTION VIEW

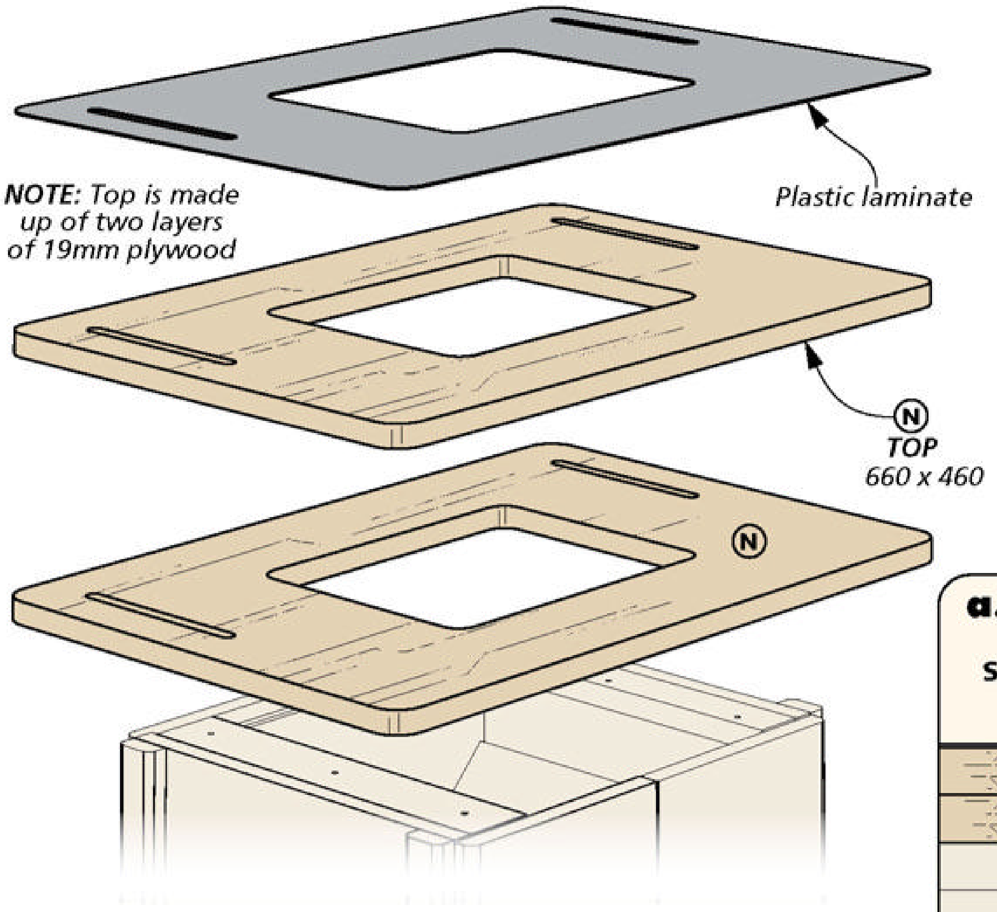
TWO-PART EUROPEAN HINGES

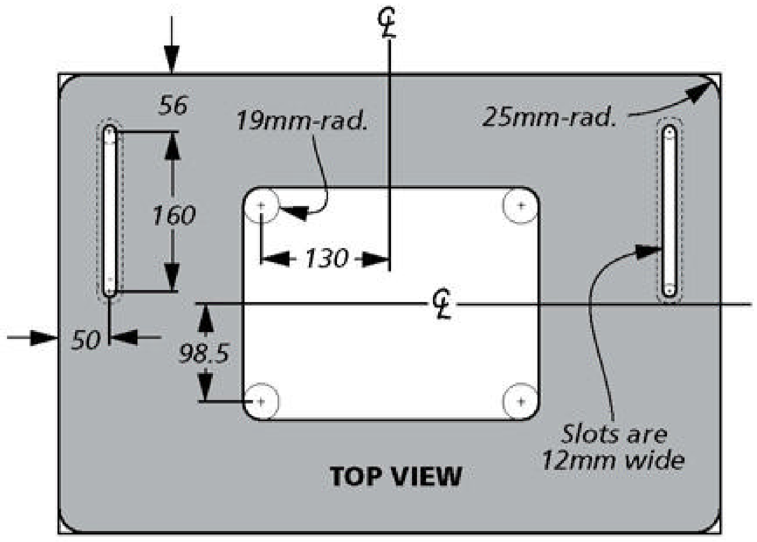

1
BACK VIEW
97
57
22
35mm-dia. hole, 11mm-deep
Top of door

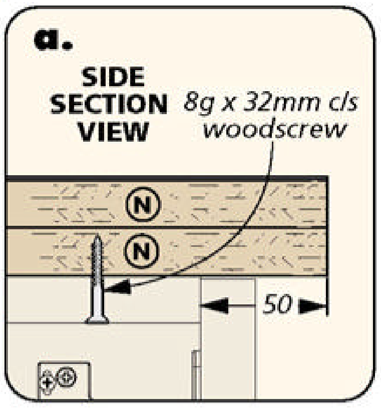
Cup Holes. The door portion of the hinge fits into 35mm holes drilled in the doors.

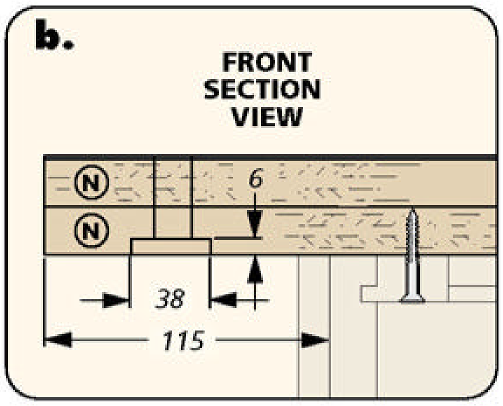

2
Attach door side of hinge with screws
a.
NOTE: 70mm at bottom of case
35
Case side of hinge

Easy Installation. Two screws secure the hinge portion. After installing the cabinet part, the two pieces snap together.


NOTE: Top is made up of two layers of 19mm plywood
Plastic laminate
N
TOP
660 x 460
N


℄
56
19mm-rad.
25mm-rad.
160
130
℄
50
98.5
Slots are 12mm wide
TOP VIEW


a.
SIDE SECTION VIEW
8g x 32mm c/s woodscrew
N
N
50


b.
FRONT SECTION VIEW
N
N
6
38
115

Where the MAGIC HAPPENS

All that's come before are opening acts. At last we get to the main event — the top. The requirements here are short: big enough, flat, durable.

Let's check some of these items off the list. As I mentioned at the outset, a lot of router tables are too big (personal preference). This one is sized to suit most project parts and get along well with the other tools in my workshop.

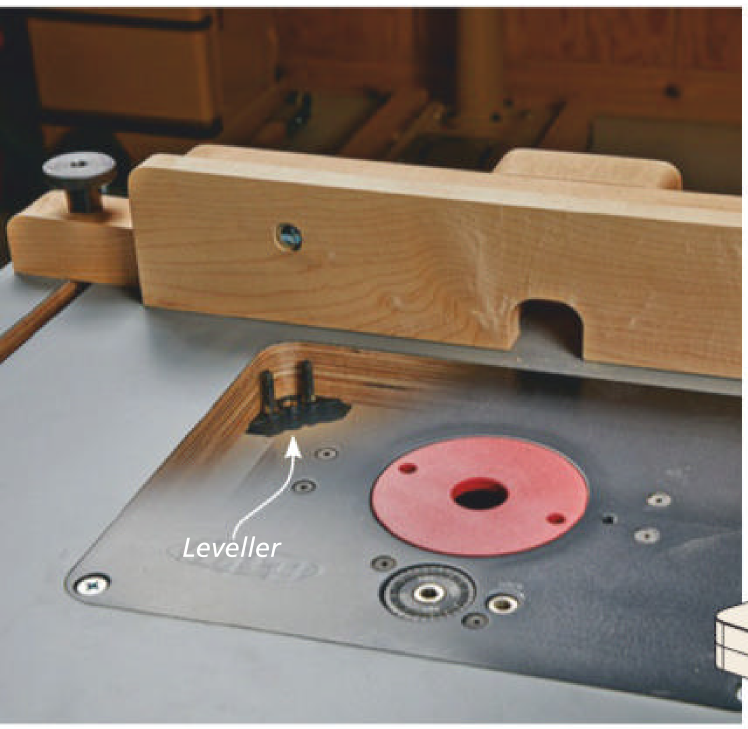
DOUBLE-STRENGTH. The top is glued up from two layers of plywood and cut to the size shown in the drawing above. I used A-C hoop pine plywood here, as it's more reliably flat than other sheet materials as well as offering the strength required for a worksurface.

After rounding the corners, I capped the top with a piece of plastic laminate (pick your favourite colour). Laminate is hard-wearing and offers a smooth, low-friction surface for moving a workpiece around.

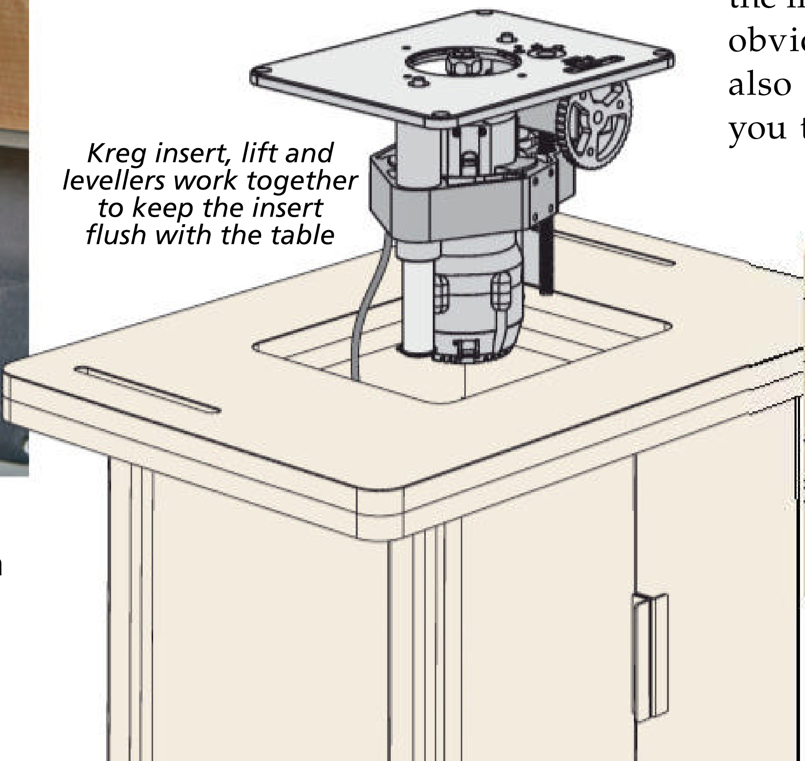
FENCE SLOTS. Cut a slot along each end of the top, as shown in the "Top View" drawing. These slots accept the fence we'll come to shortly. There's a narrow through slot and a stepped portion on the bottom face (detail 'b'). A plunge router with an edge guide is the approach I used to make these.

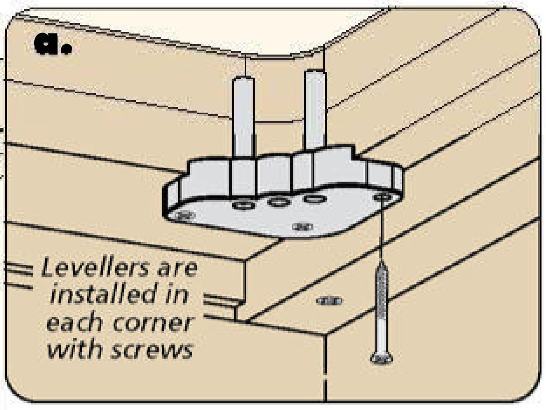
INSERT PLATE KIT. It's time to add the router part of this router table. I used a kit from Kreg Tool that includes an insert plate, router lift and levellers, as shown in the drawing and photo below.

All you need to do is make an opening in the table top that matches the size of the insert plate. An insert plate leveller is attached in each corner (detail 'a' below). It has two posts to help level the insert plate (which should be pretty obvious based on the name.) But it also has a threaded insert that allows you to secure the plate to the leveller.



▲ Insert plate levellers offer finetuning and a way to secure the plate to the table top.


Kreg insert, lift and levellers work together to keep the insert flush with the table



Levellers are installed in each corner with screws

This cuts down on vibration and noise that can occur on other insert plate set-ups.

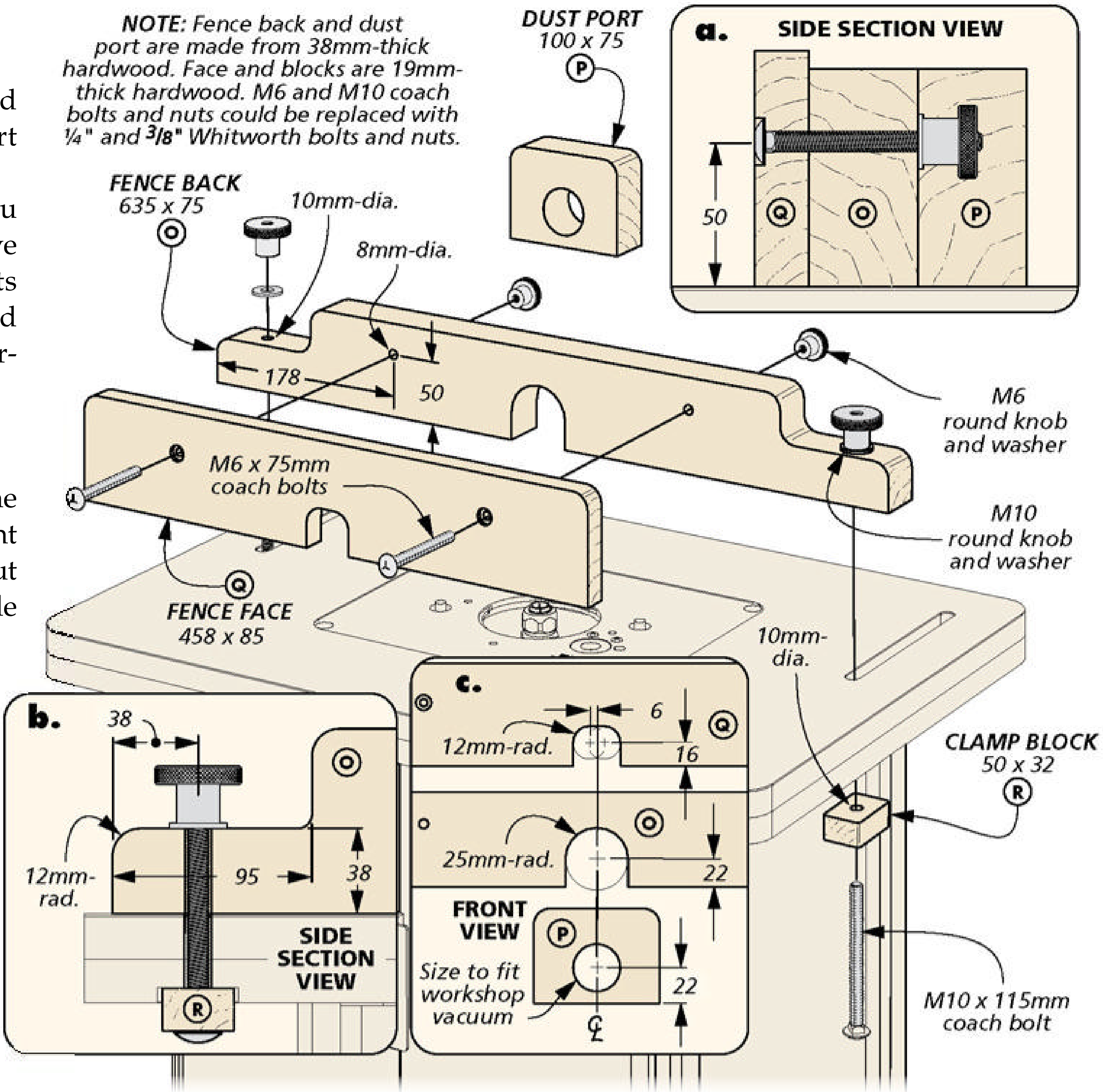
Completing this work means you can attach the top to the case. Drive three screws up through the cleats into the top. Check out details 'a' and 'b' on the previous page for the overhang numbers.

A STEP UP FENCE

For years, Steve Johnson, one of the workshop craftsmen used a straight piece of hardwood with a bit cutout as his fence. The fence on this table riffs on that uncomplicated concept with a few convenience upgrades. The back is a thick block with stepped ends for the adjustment knobs. Do you notice the roundover theme in the main drawing and detail 'b?' On the back is another thick block with a hole to connect your workshop vacuum (detail 'c').

An interchangeable face is attached to the front. This lets you create a fence with custom openings to suit various bits.

What about a fence with sliding faces? I'm not a fan. The faces too often end up misaligned, resulting in poor cuts.


NOTE: Fence back and dust port are made from 38mm-thick hardwood. Face and blocks are 19mm-thick hardwood. M6 and M10 coach bolts and nuts could be replaced with ¼" and ⅜" Whitworth bolts and nuts.
DUST PORT
100 x 75
P
a.
SIDE SECTION VIEW
50
Q
O
P
FENCE BACK
635 x 75
O
10mm-dia.
8mm-dia.
178
50
M6 round knob and washer
M6 x 75mm coach bolts
M10 round knob and washer
Q
FENCE FACE
458 x 85
10mm-dia.
CLAMP BLOCK
50 x 32
R
M10 x 115mm coach bolt
b.
38
O
12mm-rad.
95
38
SIDE SECTION VIEW
R
c.
6
Q
12mm-rad.
16
O
25mm-rad.
22
FRONT VIEW
P
Size to fit workshop vacuum
22
℄

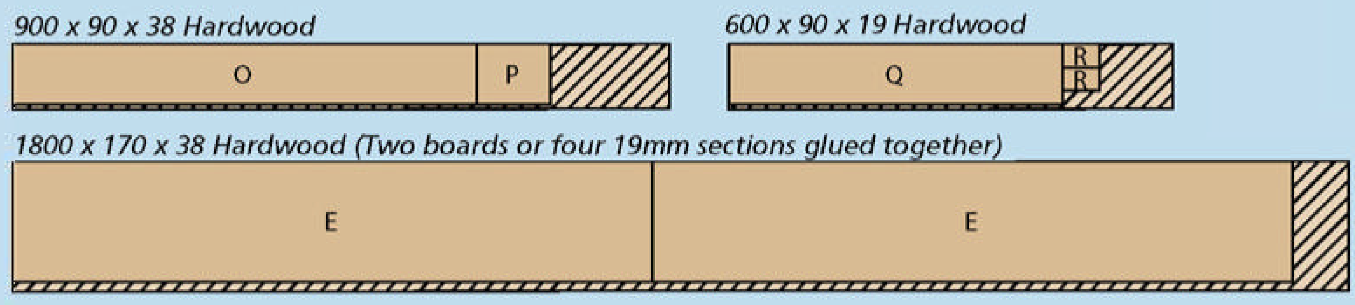
Finally, cut clamp blocks to anchor a pair of coach bolts. These slide in the slots on the bottom face of the table, as shown in detail 'b,' to adjust the fence.

Once this table takes its place in your workshop, you'll find a valuable and versatile member of the team. And one that's easy on the eyes, too. W

Materials, Supplies & Cutting Diagram

A	Sides (2)	625 x 370 x 19ply
B	Back (1)	625 x 430 x 19ply
C	Shelves (2)	404 x 370 x 19ply
D	Cleats (2)	370 x 35 x 19ply
E	Legs (4)	876 x 165 x 38
F	Dust Panels (2)	364 x 255 x 19ply
G	Hopper Sides (2)	364 x 255 x 6ply
H	Hopper Bottom (1)	364 x 32 x 6ply
I	Braces (2)	137 x 54 x 12ply
J	Drawer Frts./Backs (6)	366 x 45 x 12ply
K	Drawer Sides (6)	343 x 45 x 12ply
L	Drawer Bottoms (3)	354 x 343 x 6ply
M	Doors (2)	623 x 214 x 19ply
N	Tops (2)	660 x 460 x 19ply
O	Fence Back (1)	635 x 75 x 38
P	Dust Port (1)	100 x 75 x 38
Q	Fence Face (1)	458 x 85 x 19
R	Clamp Blocks (2)	50 x 32 x 19

- (12) 8g x 32mm c/s Woodscrews
- (14) 8g x 38mm c/s Woodscrews
- (3 pr.) 355mm Full-Extension Slides w/Screws
- (2) 95mm Edge Pulls w/Screws
- (2 pr.) 155° Full Overlay Hinges
- (1) Router Insert Plate w/Levellers
- (1) Router Lift
- (2) M10 x 114mm Coach Bolts
- (2) 10mm Flat Washers
- (2) M10 Steel Knurled Knobs
- (2) M6 x 75mm Coach Bolts
- (2) 6mm Flat Washers
- (2) M6 Steel Knurled Knobs


900 x 90 x 38 Hardwood
O
P
600 x 90 x 19 Hardwood
Q
R
R
1800 x 170 x 38 Hardwood (Two boards or four 19mm sections glued together)
E
E

ALSO NEEDED: *One 2400 x 1200 sheet of A-C hoop pine plywood. One 1200 x 1200 sheet of 12mm plywood. One 1200 x 120 sheet of 6mm plywood*

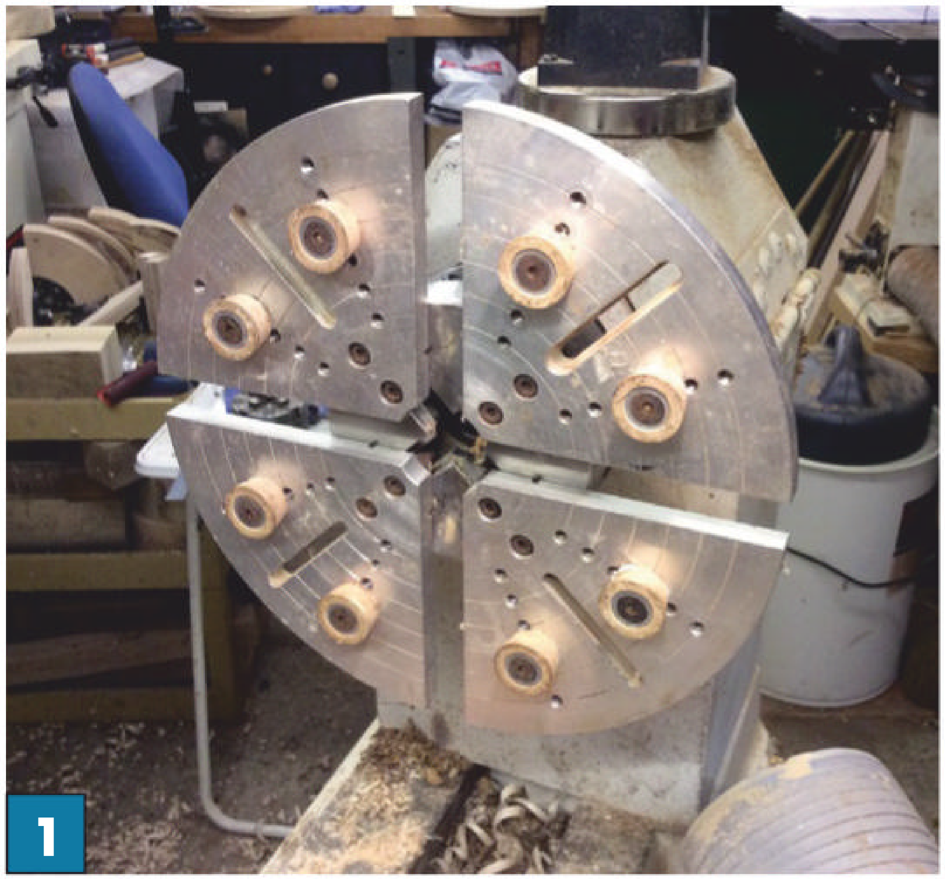
To Clean or Not To Clean?

Colwin Way tackles the questions raised by reversing mounting work to clean up bases.

Reversing turning work to better deal with the recesses or spigots/tenons used initially to hold the piece poses more than a few questions. Do you need to? How would you do it? And what's the safest method? The answers will vary depending on your ability, the type of bowl you're trying to make and your equipment. Here, I'm going to suggest some of the cheaper – and in some cases free – options available to reversing mounting work. As always, these are just a few types I commonly use and ones that work the best for me. There are numerous other methods of reversing, for example vacuum chucking, but these can be a little on the pricey side, especially for a beginner.

EQUIPMENT USED
- 6mm bowl gouge
- 10mm bowl gouge
- 20mm skew
- 3mm parting tool
- BB-grade plywood
- Steel rule
- Square dividers
- 1 x roll of router matting
- Bradawl
- Faceplate ring
- 50mm sanding power pad
- Contact adhesive
- Shallow carving gouge
- Pull saw

PHOTOGRAPHS BY COLWIN WAY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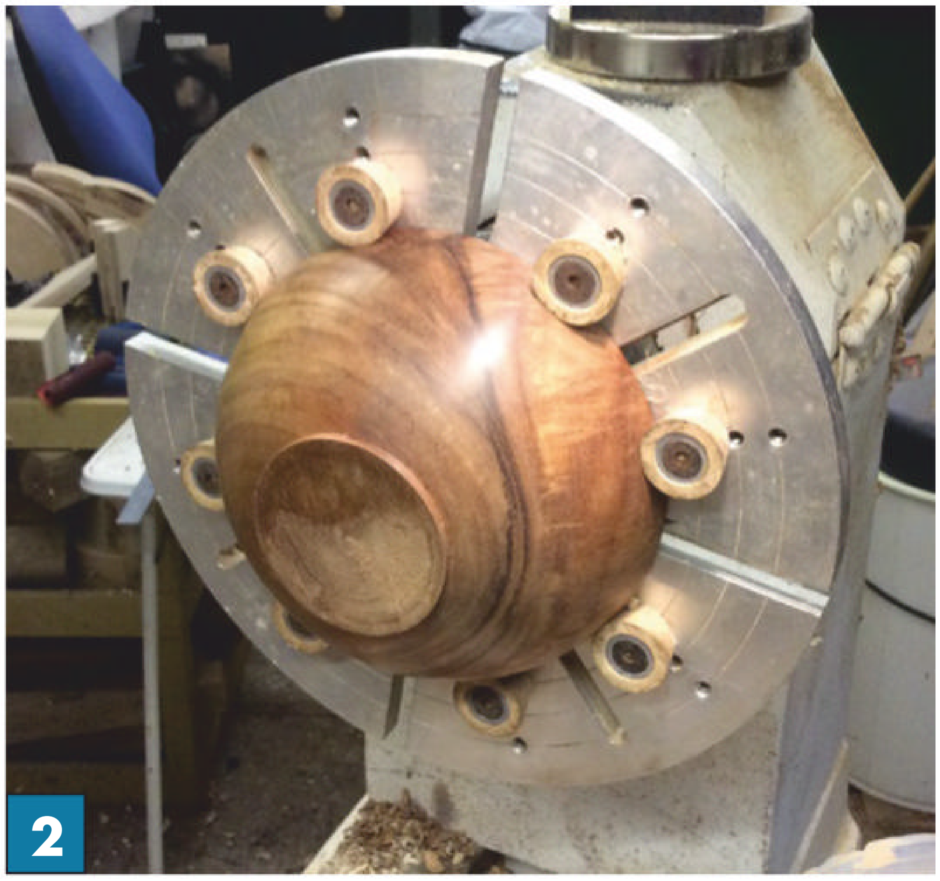
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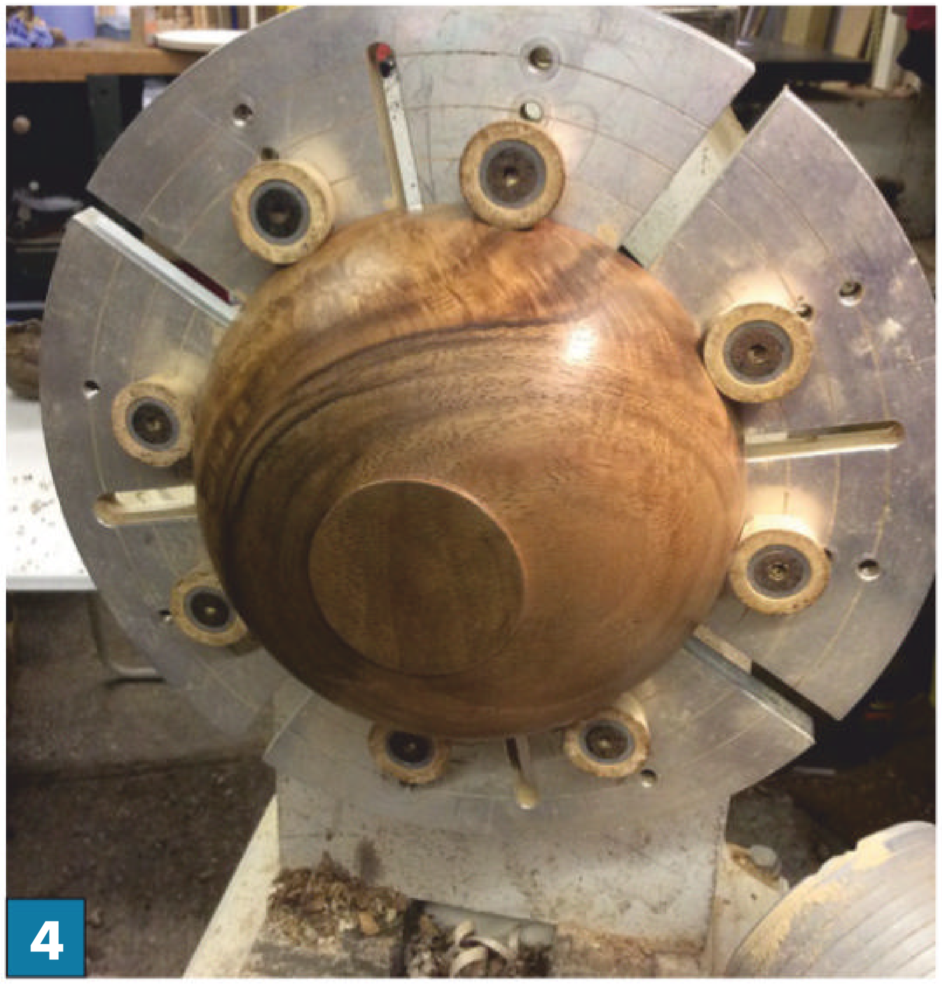

4

Button jaws

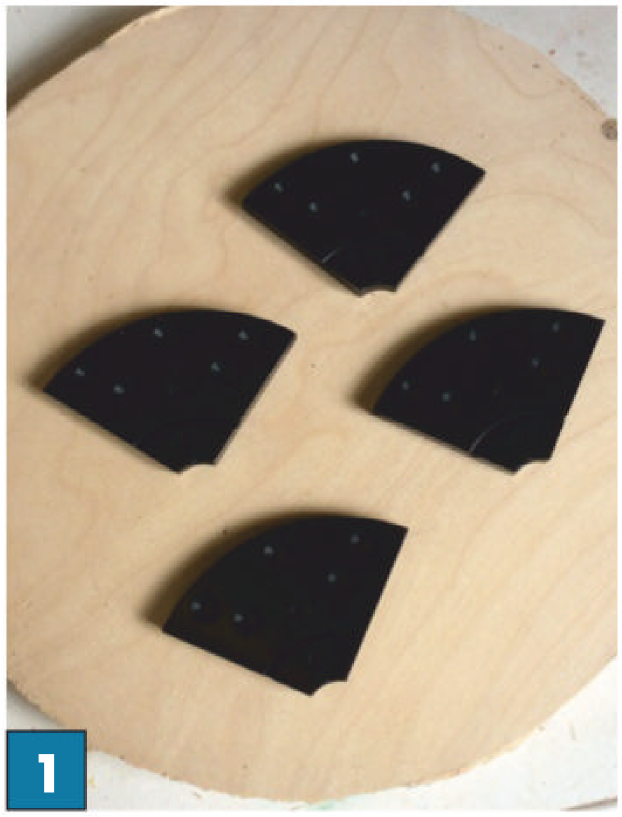
Button jaws or Cole jaws are an easy and convenient way of holding the rim of a finished bowl to remove the foot or holding method. They comprise eight dovetailed rubber buttons that can be moved to different positions of the jaws to accommodate different sizes of bowl. To demonstrate the button jaws I've turned up a small bowl measuring 180 x 75mm out of Indian Laurel (*Terminalia alata*). I've left a sacrificial foot on the bowl measuring 65mm diameter x 4mm deep which now needs to be taken off. Here's how to do it…

1 Set up the button jaws in the chuck ready to accept the bowl – with the jaws already set to the correct position. To make the job of opening and closing the jaws in the chuck easier I recommend a long chuck key as this will stop the key and chuck fouling each other.

2 The bowl is now attached to the button jaws and ready for the foot to be turned off.

3 Turning the foot off with a 6mm bowl gouge, be careful to keep the bevel rubbing which will help prevent the gouge from catching.

4 After sanding and polishing I've left a small radiused foot on the bowl to finish the piece off.



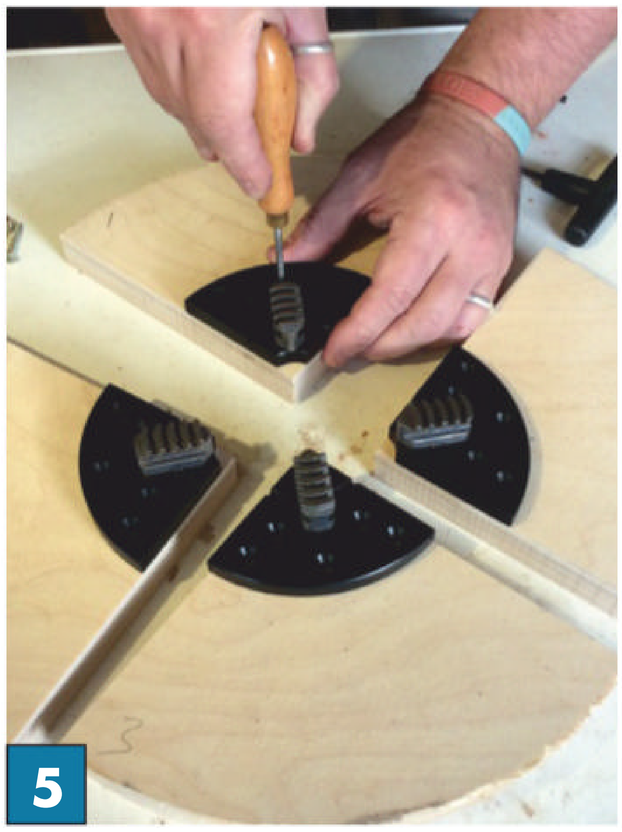
1

2

CRAFT SUPPLIES

3

4



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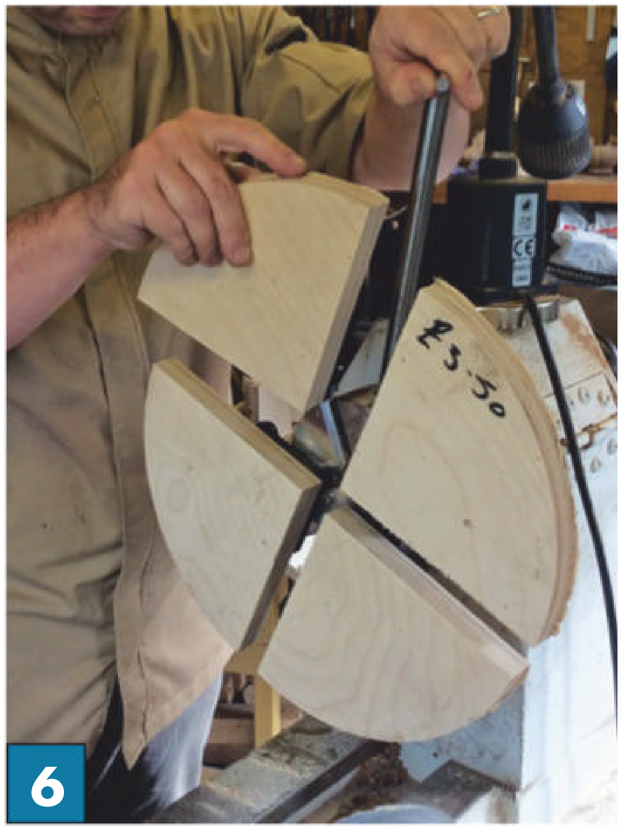


6

Woodplate jaws

Woodplate jaws work in a similar way to button jaws, but require some work before they can be used. They can be made to a size and shape to suit your project and have a much greater surface contact area than Button jaws. This is by far my favourite jaw for reversing bowls. The best material for your jaws would be a good quality plywood, I use BB-grade ply as I find this has no voids unlike some cheaper alternatives. Most of my wood jaws comprise two layers of 25mm plywood enabling me to create lots of hold points. Here's how to do it…

1 Take your good-quality plywood and a set of plate jaws. I'm making a set of 360mm jaws and have already cut the plywood to a circle.

2 Divide the disc into quadrants. First, mark the centre and draw a straight line through it. Using this line and a square, draw another line 90° to this one dividing the disc into four.

3 After marking the disc into quadrants, cut through the line. For this I'm using a bandsaw.

4 Now that we have four pieces we need to number the jaws in the order they were cut. These numbers will then be matched up with the numbers on both the plate jaws and accessory mounting jaws in order to keep everything running concentrically.

5 Attach the accessory mounting jaws to the plate jaws. Making sure to match the numbers all around, position the jaws over the ply quadrants and bradawl mark the screw positions before attaching with screws.

6 Now that everything has been cut and screwed together we can attach the jaws to the chuck. As you can see here, using a long chuck key is a must.

7 To turn the first recess in your plate jaw you first need to make sure the jaw is firm; this means holding something in the jaws. I hold a small piece of 10mm dowel which gives me a small gap between the jaws at the perfect circle as this allows greater room for error when sizing a bowl to fit. This step is also essential for safety reasons – you don't want to be turning the ply face with the jaw loose in the chuck!

8 I'm going to cut a recess in the plate jaws to take this cherry (Prunus avium) bowl, which measures 270mm in diameter.

9 I can now transfer this measurement onto the wood plate jaws with my dividers by taking half the bowl diameter and marking from the centre of the jaws as you can see here.

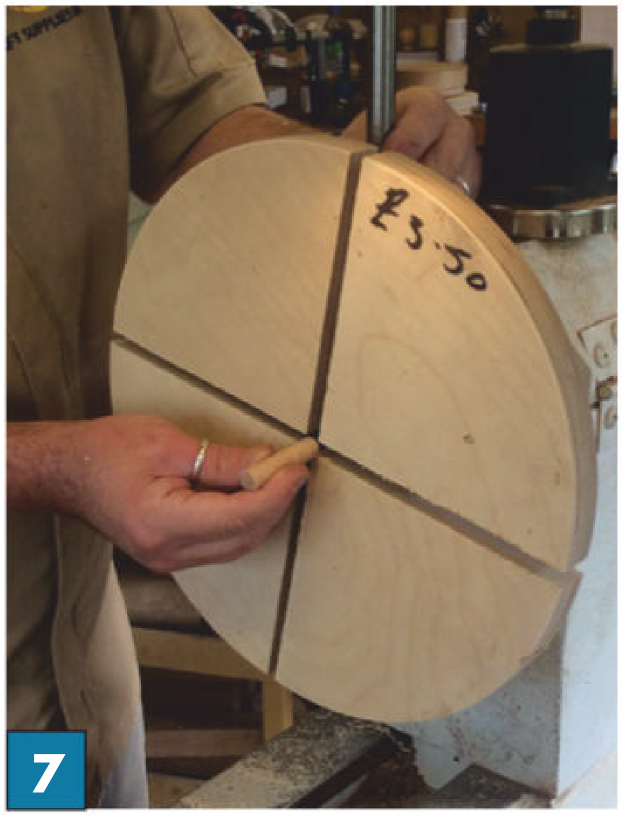
10 Now that the jaws have been marked out you are free to cut the groove in the ply using a 3mm parting tool to a depth of 5mm. After making this cut you will have to open the groove with another cut with your parting tool or with a bowl gouge. Once the opening is big enough cut the edge of the groove to a dovetail using a skew chisel flat on the toolrest.

11 Using a long chuck key you can offer up your bowl and test fit for the first time. If it has gone to plan, you can then tighten up the chuck. It's a good idea to tap slightly as you tighten to check the security.

12 The bowl is now ready for a finishing cut which is best achieved with a 6mm bowl gouge using the push cut method. When you have the shape you require, you are ready to sand and seal.

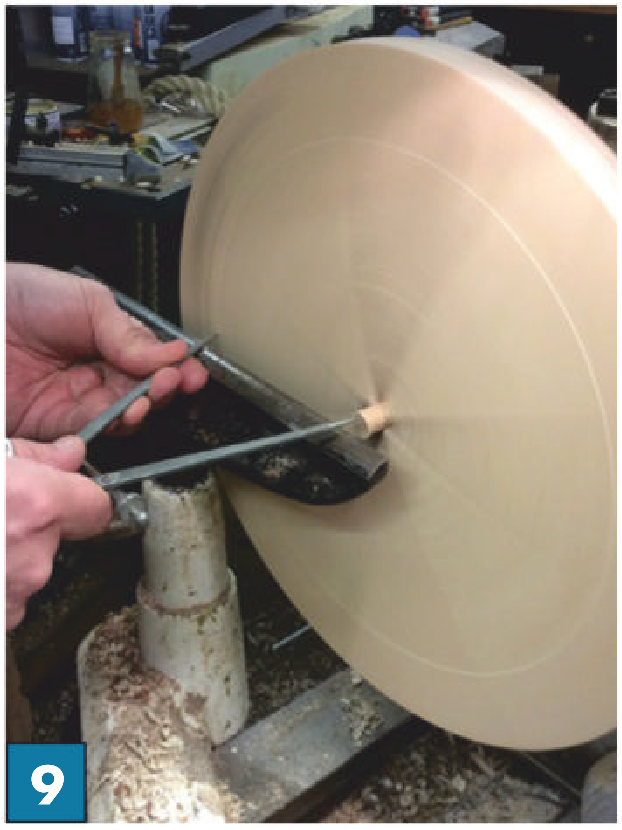
HANDY HINTS

1. Learn how to rub the bevel and you'll never look back.
2. When sanding, try to mix hand sanding with rotary sanding as this will speed up the sanding process.
3. If you're new to bowl turning start small!
4. Small 25mm or 50mm power-sanding pads can be used in your cordless drill to finish the bottom of your bowl.
5. Long chuck keys are a must when using button or woodplate jaws.



7

8



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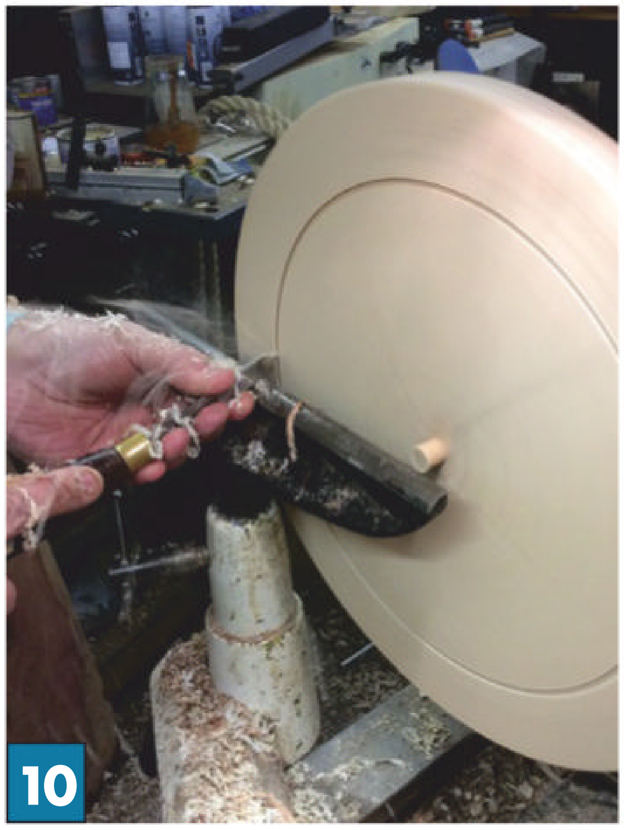

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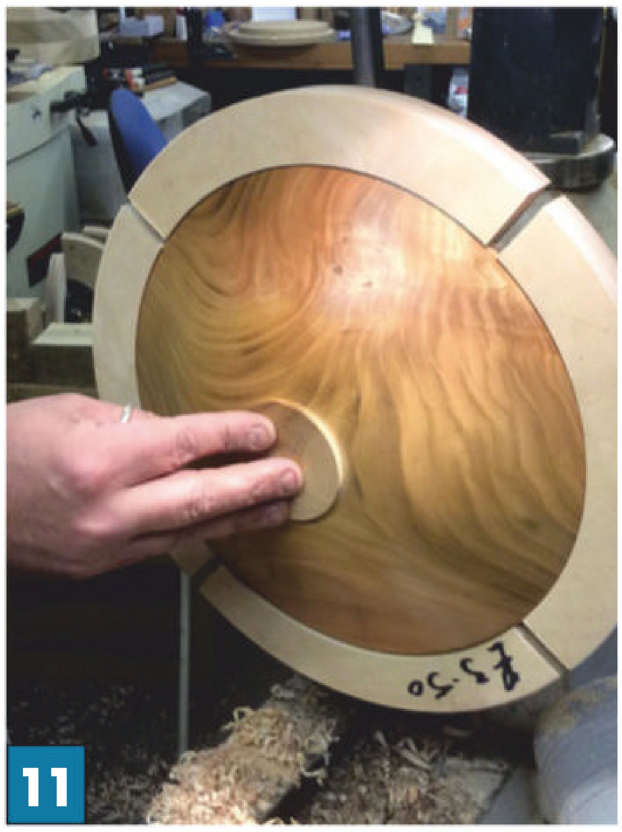

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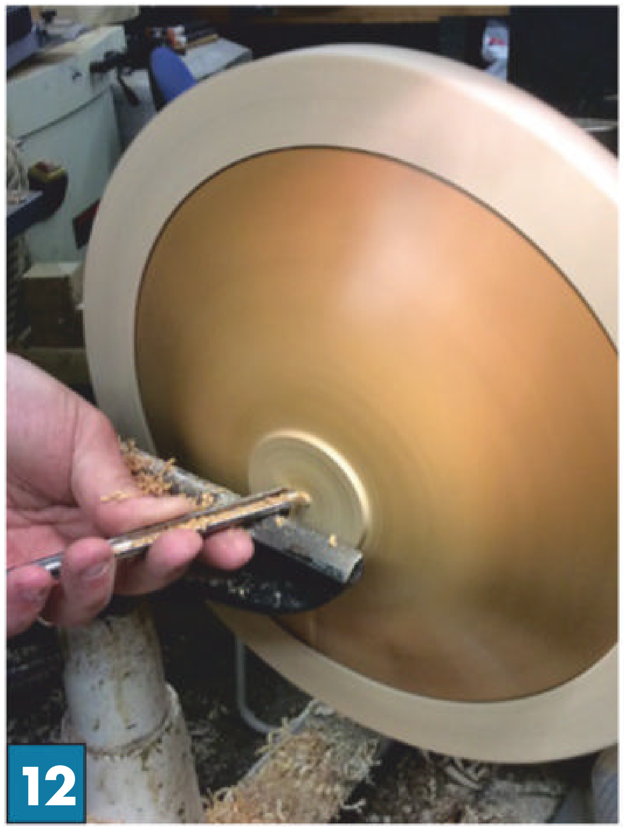
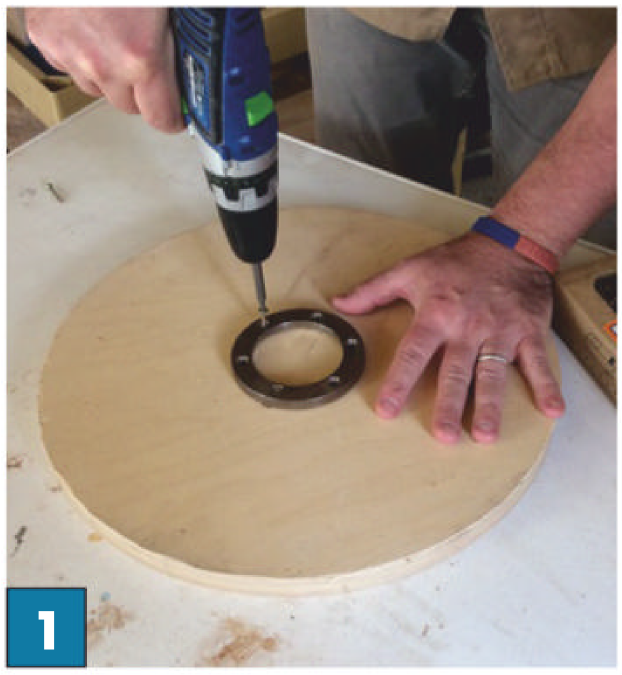


12

Flat plate drive

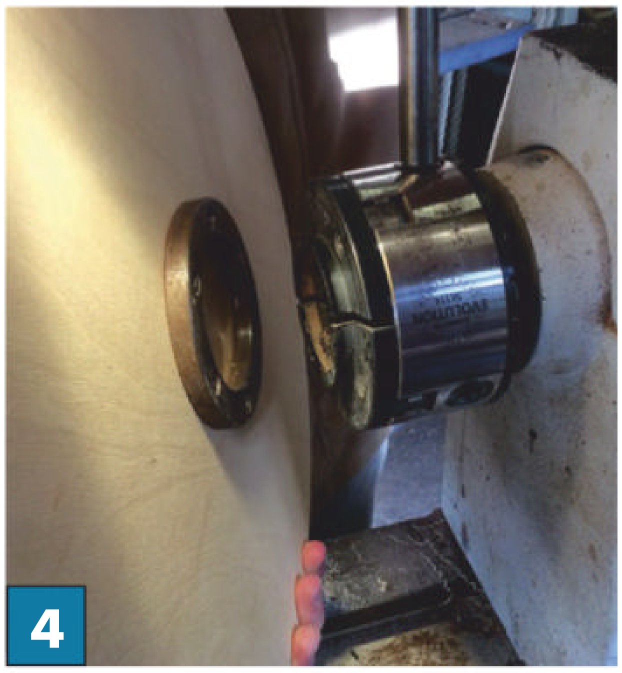
A flat plate drive is a method of turning a bowl to a finish between centres and involves the bowl face being pressed against a plywood or timber disc by the tailstock. To soften the contact area we are going to glue on a layer of router matting which will create a good contact pad that will protect the surface of your bowl and provide a good non-slip surface for the drive plate at the same time. Again, I prefer to use a good-quality BB-grade plywood and 25mm is a must; much thinner and the ply will have too much bend in it.

As well as a flat plate there is nothing stopping you turning a slightly radius plate drive from a bowl blank and placing some router matting between this and the bowl before turning. It's important that you add some type of cushioning between the bowl and drive to avoid damage to the bowl. It's also worth spending a bit of time making these plates as they will give you many years of reliable service. Here's how to do it…


1

2

3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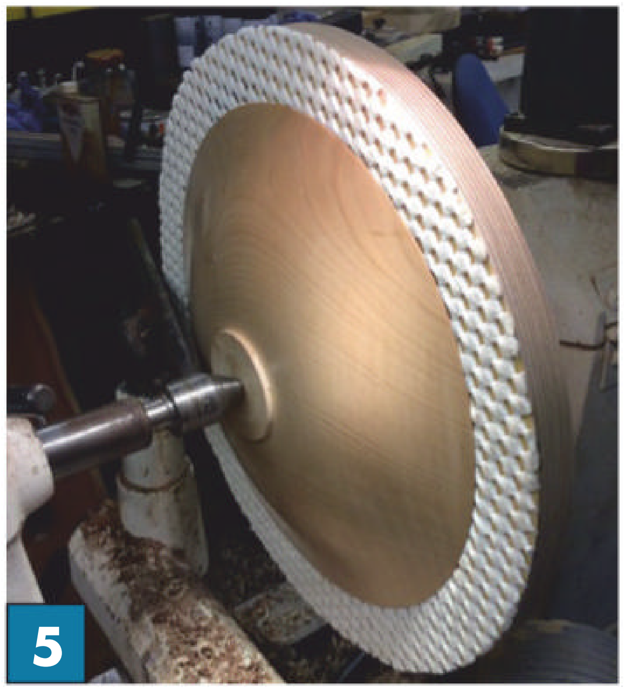
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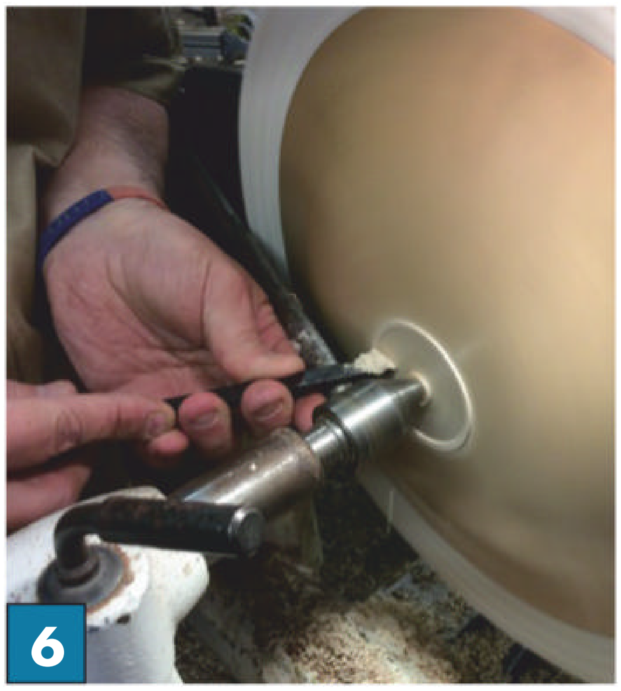

6

1 To start making a flat plate drive you will need to decide on the size of plate you want. This will depend on the size of bowls that you most commonly make. Here, I'm making a 360mm plate which will do a wide variety of bowls and platters. I'm mounting a face plate ring onto the disc which will mean I can easily and quickly mount the plate onto my chuck after taking the bowl off.

2 On the other side of the plate I'm using a contact adhesive to stick on a sheet of matting. This matting will prevent damage to the bowl when reversing. It's a great surface and has excellent adhesion as well as a nice soft texture.

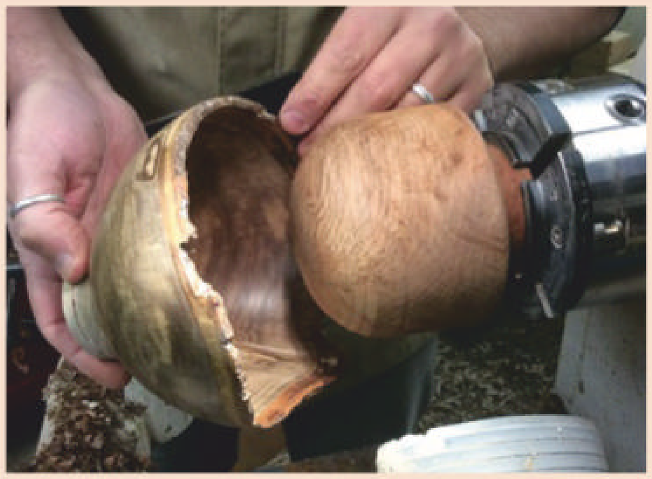
3 Once the glue has dried you can cut away any waste matting keeping any offcuts for other holding jobs.

4 Now everything is ready to connect to the chuck using the faceplate ring.

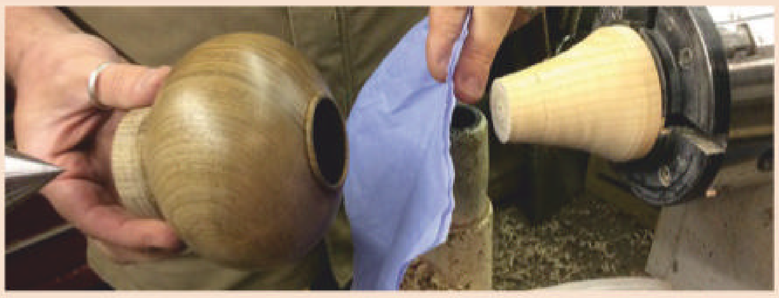
5 As you can see here I'm finishing a sycamore platter. Bring the tailstock up, centre the bowl and add gentle pressure, turning the bowl by hand to eyeball for concentricity. Ensure all of your locking handles have been tightened up on your tailstock and start the lathe at its lowest speed then gently turning the lathe up to a workable one.

6 Everything is now in position and you are ready to turn off the remaining foot to leave the design that you want. You will have to leave a small spigot where the tailstock centre lies but this can be carefully nipped off with a carving chisel. Then using a small 50mm sanding disc held in the chuck or cordless drill sand the bottom to a finish. W

MORE QUICK WAYS TO REVERSE AWKWARD SHAPES



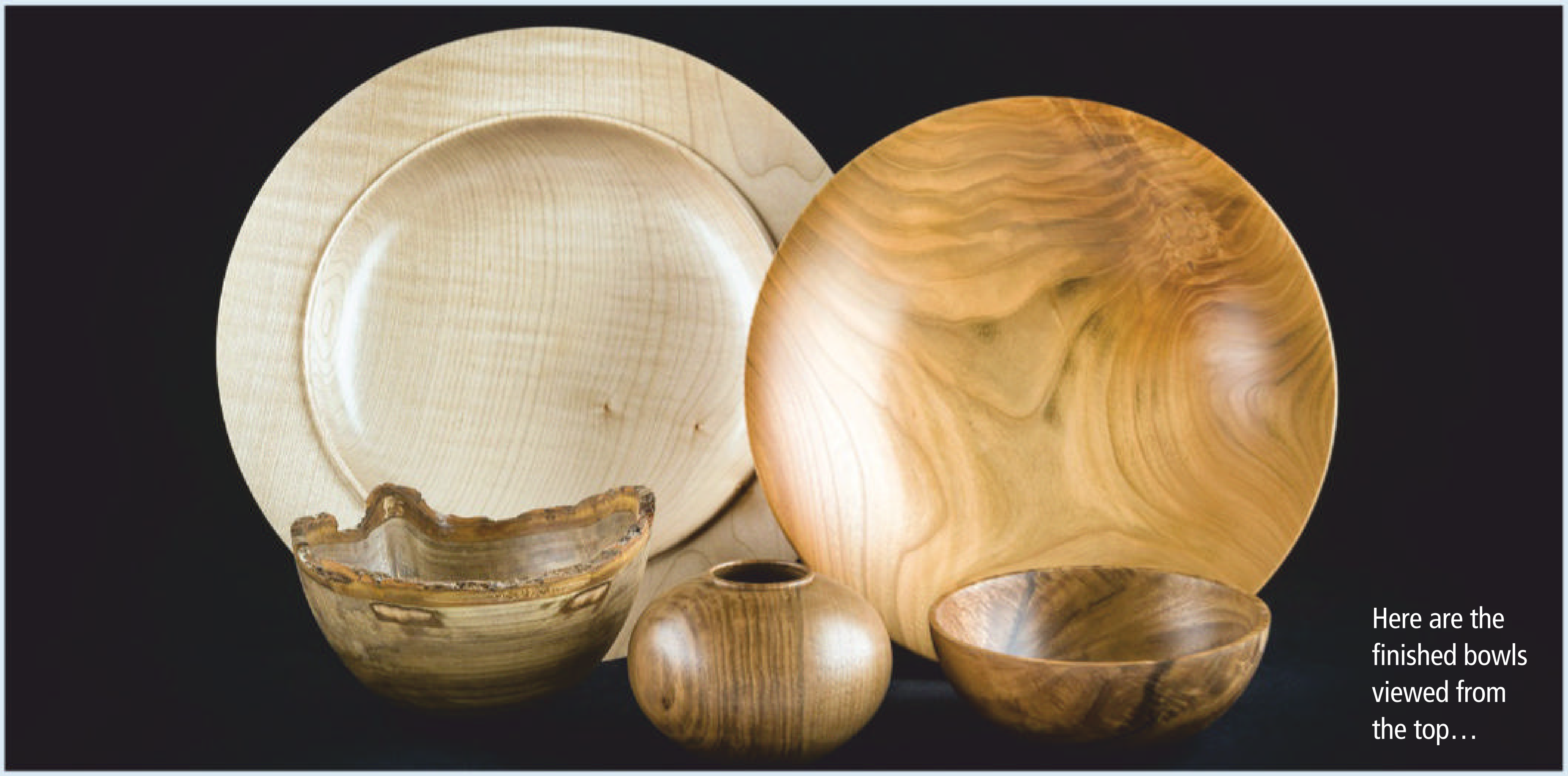
◄ In this picture I'm reversing a poplar natural edge bowl onto a wooden dome drive turned from a piece of scrap timber. Make sure you soften the surface with a piece of tissue or rag to avoid damaging the surface of the vessel.



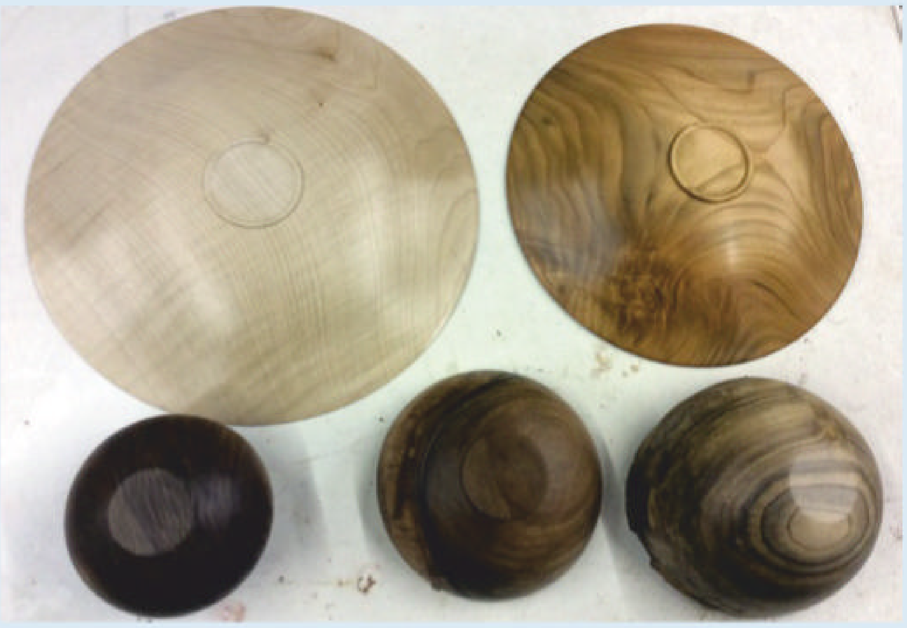
▲ Again, in this picture, I am finishing off a small walnut hollow form using a similar drive leaving a small spigot where the tailstock is which can be cleaned up later with a carving knife and small sanding disc.

CLEANED TO PERFECTION

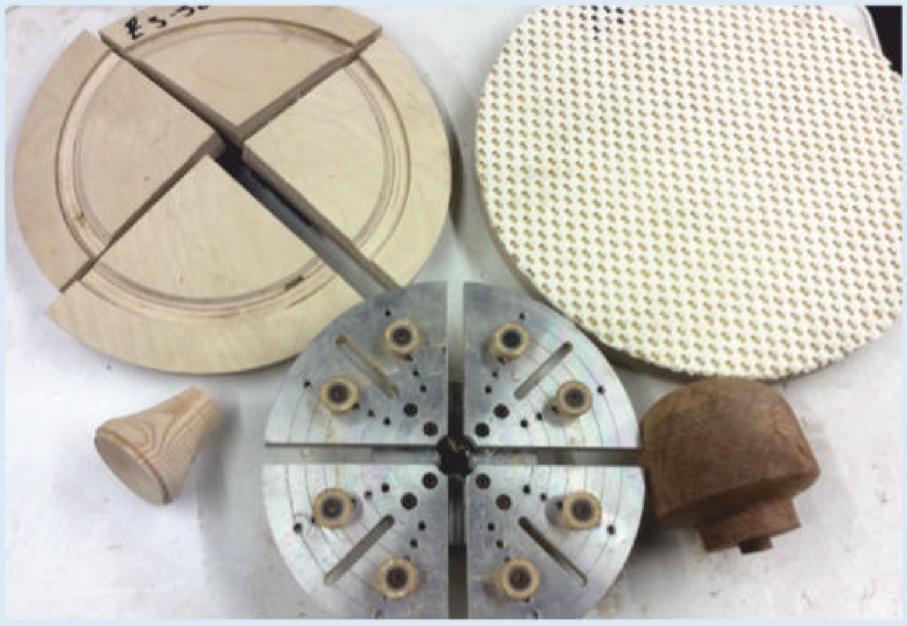
I made five different projects to explore some of the techniques that are involved in reversing mounting work: a conventional bowl, two platters, a natural edge bowl and a hollow form…



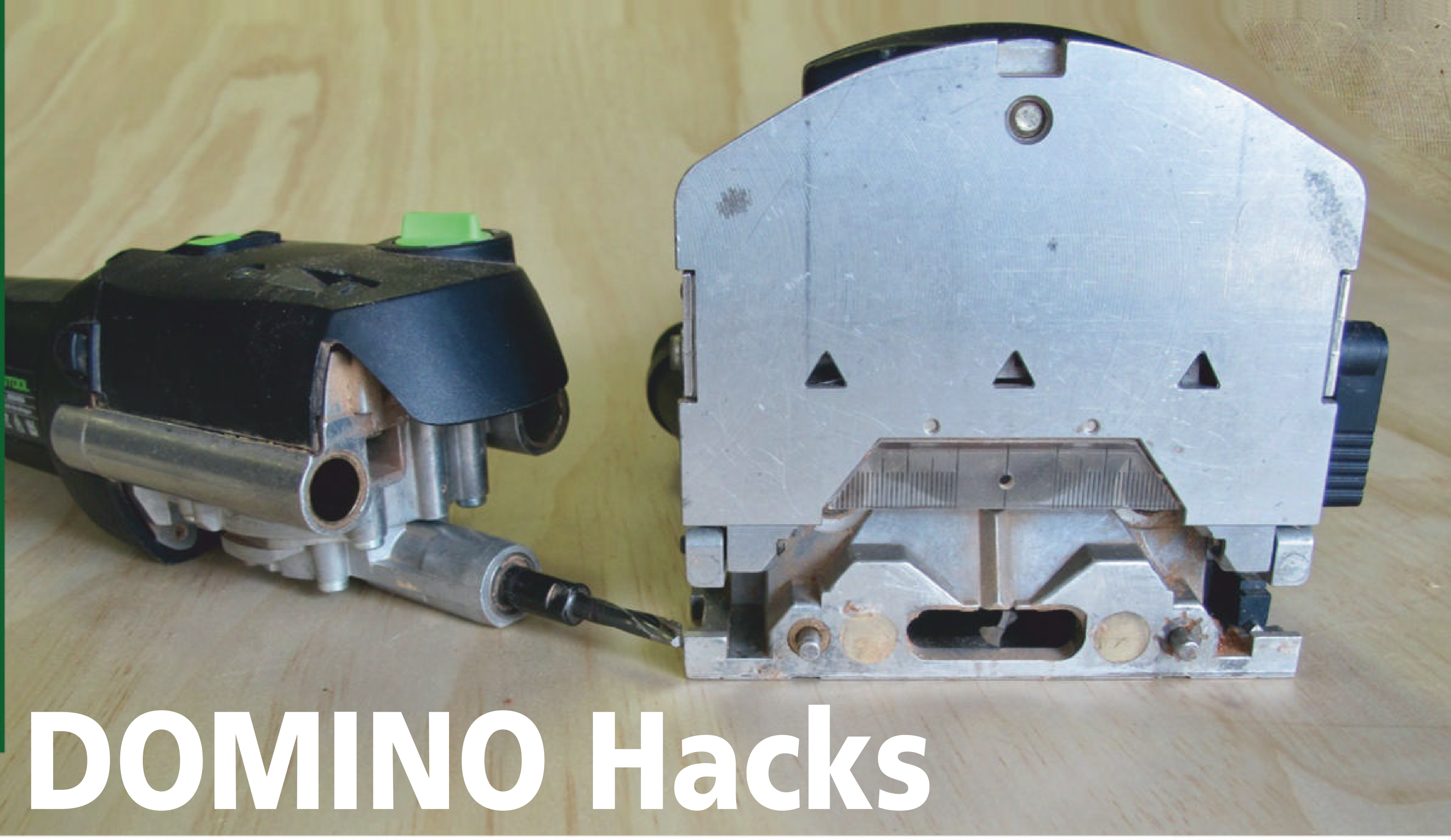
Here are the finished bowls viewed from the top…



▲ … and their respective cleaned-up bases.



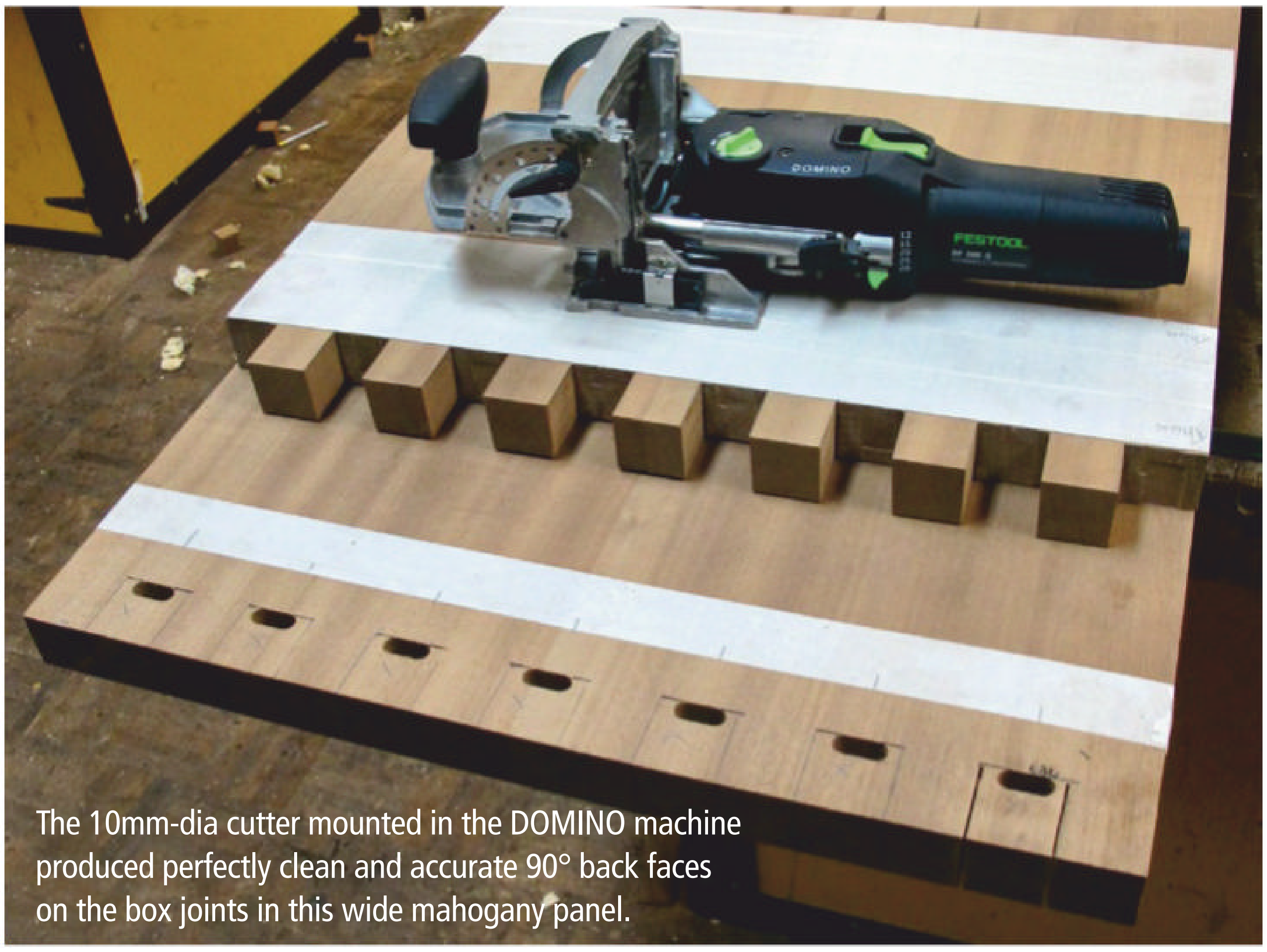
▲ Here are some of the holding devices that could be used.



DOMINO Hacks

The Festool DOMINO machine is a clever tool that cuts super accurate floating tenon joints with ease. But that is not all it can do!

The Festool DOMINO machine has to be the most expensive and well built hand-held power tool in our workshop. The manufacturing tolerances in this German-made wonder are evident when you remove the faceplate assembly from the cutting head (to change cutters). A very pleasing "pop" sounds as the two round alignment rods slip out of the machine head sleeves.



The 10mm-dia cutter mounted in the DOMINO machine produced perfectly clean and accurate 90° back faces on the box joints in this wide mahogany panel.

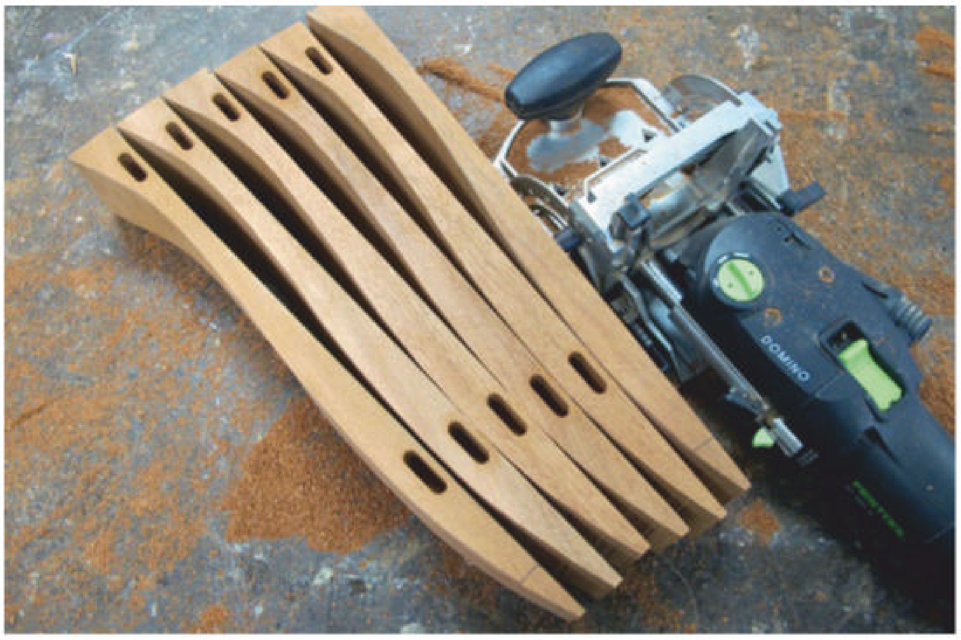
One interesting design feature that even the manual does not mention is the aluminium step to the right and left of the faceplate. It is the horizontal centre datum for the cutter. If you draw cross-hairs on a board and then line the lip of the block and the centre datum you will be bang on target!

Fundamentally the machine is a miniaturised, hand-held mortising machine. Amazingly versatile and able to be indexed at 0°, 27.5°, 45°, 67.5° and 90°, the machine rotates and oscillates 4mm, 5mm, 6mm, 8mm and 10mm cutters to three factory-set widths. Festool supplies matching floating tenons (called dominoes) but you can make your own.

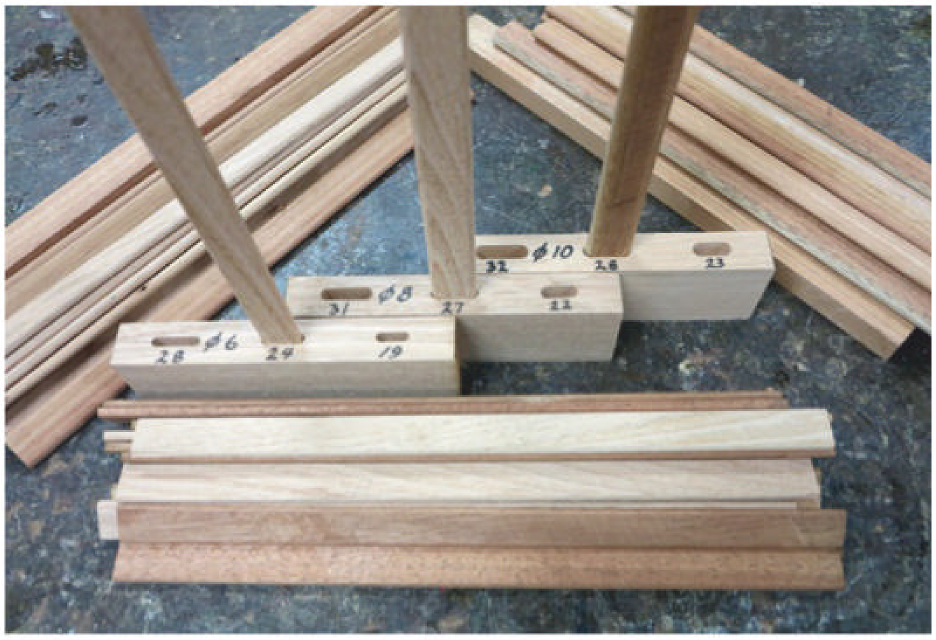
OVERSIZED BOX JOINTS

When we were faced with the challenge of cutting oversized box pin joints on 28mm-thick stock we realised that a 10mm-dia cutter mounted in a DOMINO machine could be used to cut the backs of the joints. We then used an equally well made Festool jig saw to cut the shoulders and sweep away the waste. Seeing is believing.

It was while planing these joints that we realised the design of the machine incorporated a horizontal datum! If you look closely at the image above you will see that the centre of the cutter on



▲ Notice that two different-sized dominoes were used to lock the Beta stool seat sections together, each located at the thickest part.



▲ Thinking outside the box had us playing around with screen sizes that matched the slots that the DOMINO machine can cut.

the left-hand machine is pointing at the horizontal datum on the machine to the right. Marking out the box pins was a simple exercise in geomety. First step was to divide the board into 14 equal 28mm deep blocks. The second step was to use a marking gauge to define the 28mm back line for the box pins. The next step was to mark a line 5mm inside the joint to act as the datum for the faceplate to be matched against. The 10mm-dia cutter did a great job machining a perfectly clean 90° back face!

DUNSTONE BETA STOOL

Evan Dunstone has designed a modern classic in the form of his Beta Stool. It is available in kit form and is a master class of proportion, comfort and style. I purchased the kit and enjoyed following the clear instructions and ended up with a delightful blackwood stool. The next step for me was to make the same stool out of scented rosewood. As you can see above, I profiled the seat sections first and then used dominoes to lock then together. The back of the seat sections provided the flat datum.

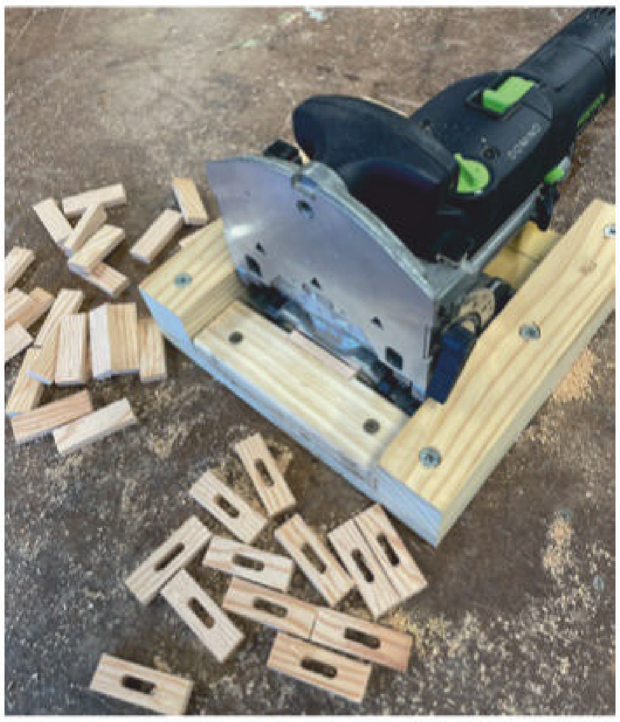
DOMINO SLED

On page 36 you can read all about how to make a Swedish trivet out of 45 x 14 x 6mm keys. Building a sled to house the DOMINO machine is intrinsic to the machining of each of the 84 keys required to make each trivet. Now that we have seen how effective a sled can be, it may be that we build more complex sleds so that chair and table components can be quickly and accurately machined over and over again without error. The hand-held nature of the DOMINO machine is a game changer!

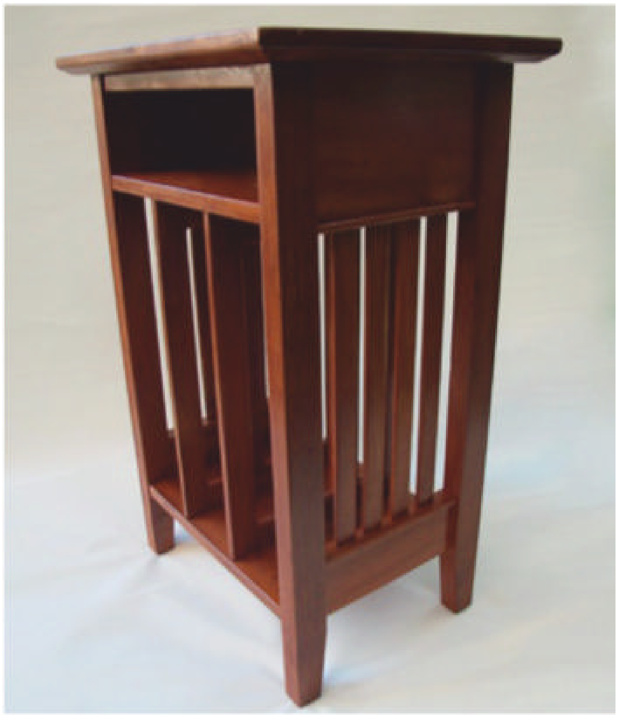
DOMINO SCREENS

It seems simple now but it was a eureka moment when we realised we could use a DOMINO machine to cut the through mortises required to house the screen panels on the magazine rack below. The real innovation was to set out and cut the four mortises in 30mm-thick stock and then rip it down the centre! The resulting 13mm-thick sections then perfectly aligned when the panel pieces were inserted and the panel popped into position. Thinking outside the box makes woodwork fun.

▲ Ten years on and the seats are still silky smooth. No movement at all, no glue line creep, perfect!



▲ Housing the DOMINO in sleds opens doors of design that we have yet to walk through.



▲ Cutting through mortises and then ripping the stock on centre produces perfect panels.

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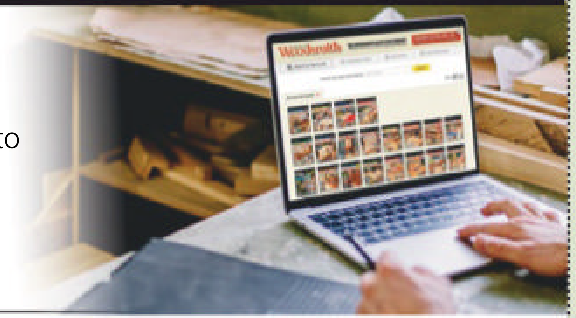

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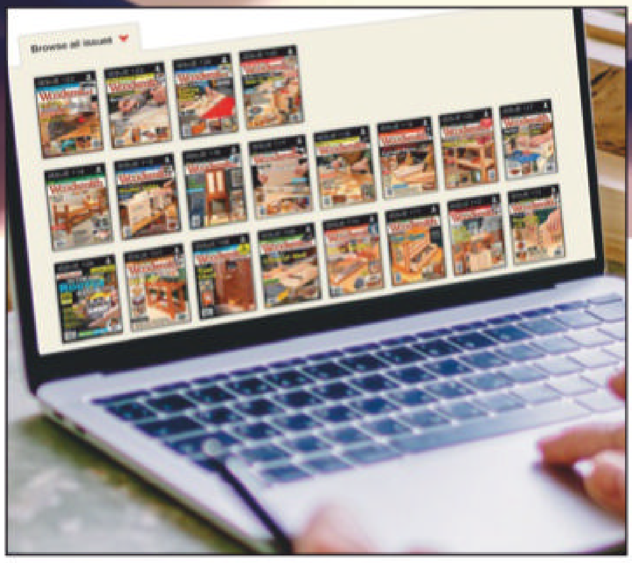
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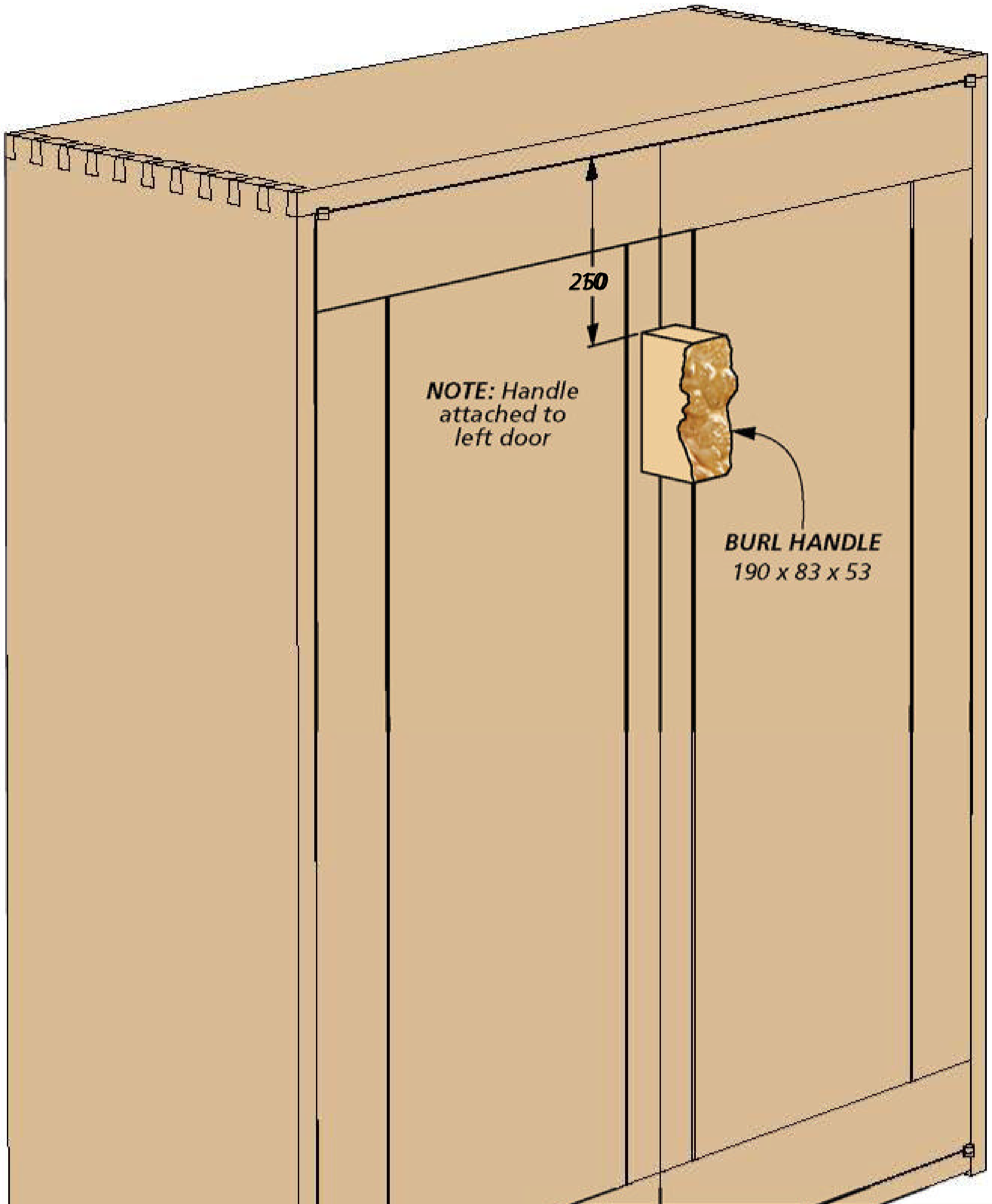
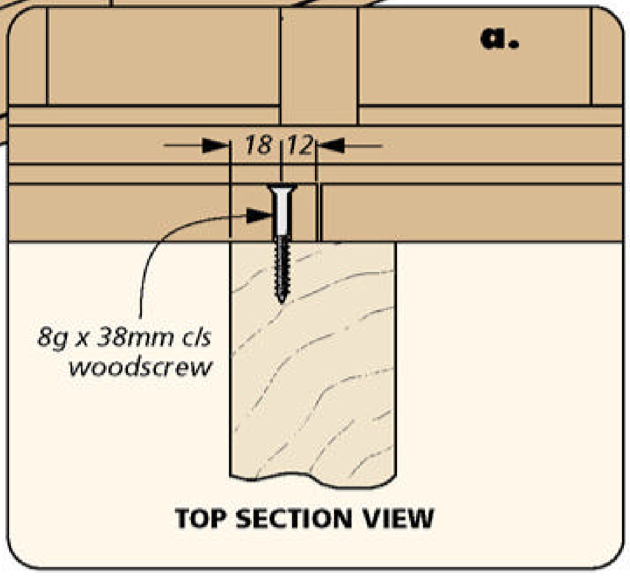

250
NOTE: Handle attached to left door
BURL HANDLE
190 x 83 x 53

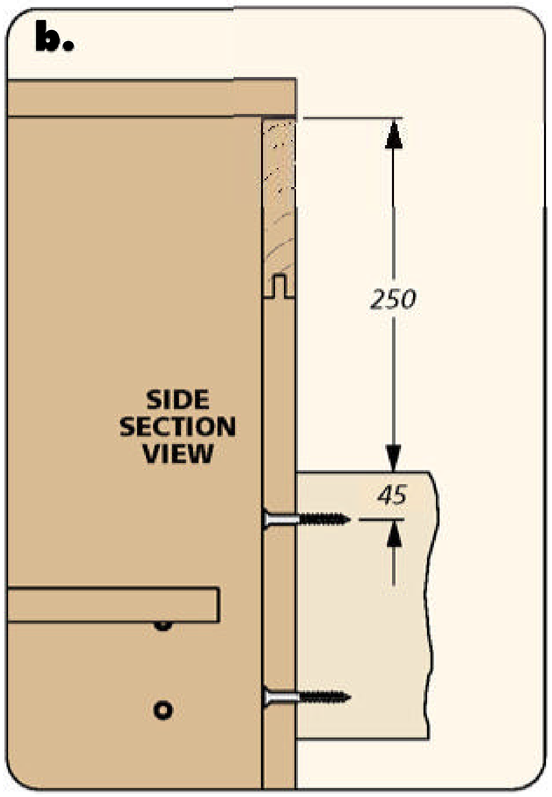
BAHUT CABINET ALTERNATE HANDLE

If you would like to keep the look of your Bahut cabinet purely along the line of how Mr Nakashima designed his, you can add the handle you see here. It's a large maple burl that our designer Dillon Baker picked up online at Etsy.com.

As you see in detail 'a,' the handle is centred on the two centre stiles and is attached to the left door. The distance down from the top rail is shown in detail 'b.'

The burl block was a little larger than the final handle. I trimmed the sides and squared the back prior to sanding smooth. I held the handle in place and marked the pilot hole locations through the predrilled holes in the door stile. After drilling the pilot holes, I sprayed the handle with two coats of lacquer. A little beeswax on the threads of the screws eased the installation. W


a.
18
12
8g x 38mm c/s woodscrew
TOP SECTION VIEW


b.
250
45
SIDE SECTION VIEW

HARDWARE & SUPPLIES SOURCES

VIBRATION AWARENESS

Mirka has highlighted how easy it is to fall victim to permanent blood vessel and nerve damage when sanding with a random orbital sander. Now that we are aware of the issue it means we need to take extra care centring sanding discs. It also means we need to take even more care centring pad savers and interface pads. Mirka, Festool and Bosch all manufacture thin pad savers and the thicker foam-based interface pads. Available from Carbatec and Best Abrasives.

BEVEL GAUGES

If you ask Chris Vesper who makes the world's best sliding bevel he will answer you with a smile. Not only are Vesper sliding bevels a thing of beauty, they are also a delight to use. Other sliding bevels are available from Timbecon, Carbatec and Japanese Tools Australia.

PLANING ROUGH STOCK

The key to dressing rough stock with a router is a spoilboard bit. These bits have been designed to dress the baseboard on a CNC router table so that the datum is always true. Spoilboard bits are available from Timbecon in ½″ and ¼″ shank sizes. Before you buy you will need to measure the diameter of the faceplate hole in your router. Spoilboard bits have cutting diameters of 38 or 50.8mm. You only need a couple of mm of bit protruding below the face of the router to machine stock smooth.

HAND PLANE RESTORATION

Before you start your journey into restoration of any rusted tool you need to pop “TTTG citric acid” into your search engine and read what the guys at The Traditional Tools Group have to say about removing rust and then neutralising the surface. Citrus acid is a fast way to remove rust. Molasses is slower but better for the environment (you can pour the chelate into the garden).

SWEDISH RING TRIVET

Festool DOMINO machines have revolutionised cabinet making since 2007. Swedish ring trivets have been whittled by hand for more than 500 years. You could use a drill press to bore out a series of 4mm holes and then use the same drill as a ream to create a slot. Otherwise a sled could be built for a plunge router to slide in to create a slot. Once you have built a sled, next step would be to cut a mortise in some 5mm MDF to house the link while it is being machined. DOMINO machines are available from Carbatec.

BAHUT CABINET

Pivot hinges are stocked by The Wood Works as well as Lee Valley and Rockler. 9mm ball catches are available from Lee Valley and Rockler. Making your own dowel to match the timber you make the cabinet out of will require a dowel plate from either Lie-Nielsen, The Wood Works or McJing.

ROUTER TABLE

Carbatec is the place to go for all Kreg products. Timbecon has similar router plate inserts and can supply the premium Sherwood plate and lift system.

M6 and ¼″ whit coach bolts and nuts will work just fine with the fence system. It is a personal choice (or what is locally available). Knurled knobs are available online from Maxiloc.

SOURCES CONTACT DETAILS

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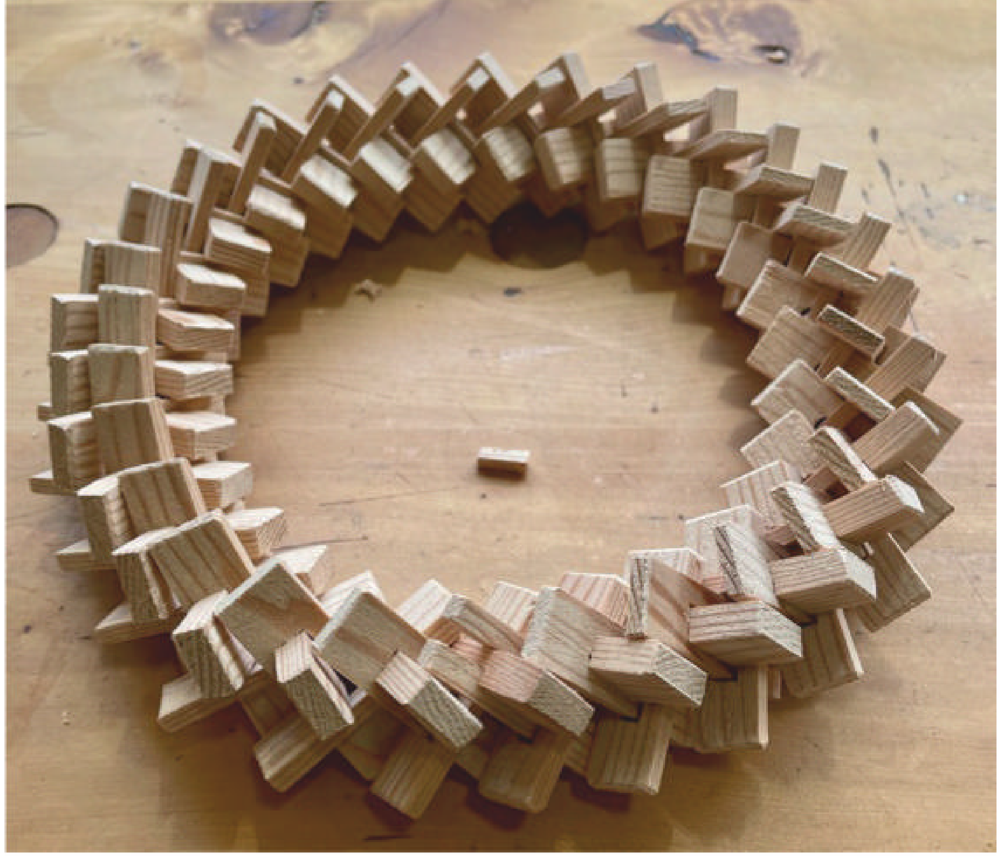
sliding bevels

Bahut Cabinet. Building this beautiful George Nakashima object is a heavy-duty, deceptively simple woodworking project. We show you how beginning on page 44.

Final details

▲ *Router Table.* This project makes the case that workshop machines should work hard and look great too. Plans begin on page 52.



▲ *Swedish Ring Trivet.* Chris Clark will take you through all the steps to make this trivet (aka yeast ring) beginning on page 36.

▲ *Reverse Mounting.* Colin Way tackles the questions raised by reversing mounting work to clean up bases. Step-by-step instructions start on page 60.

▲ *Hand Plane Restoration.* We take you through the process of restoring an old Stanley No. 26 plane. Turn to page 30 to learn more.

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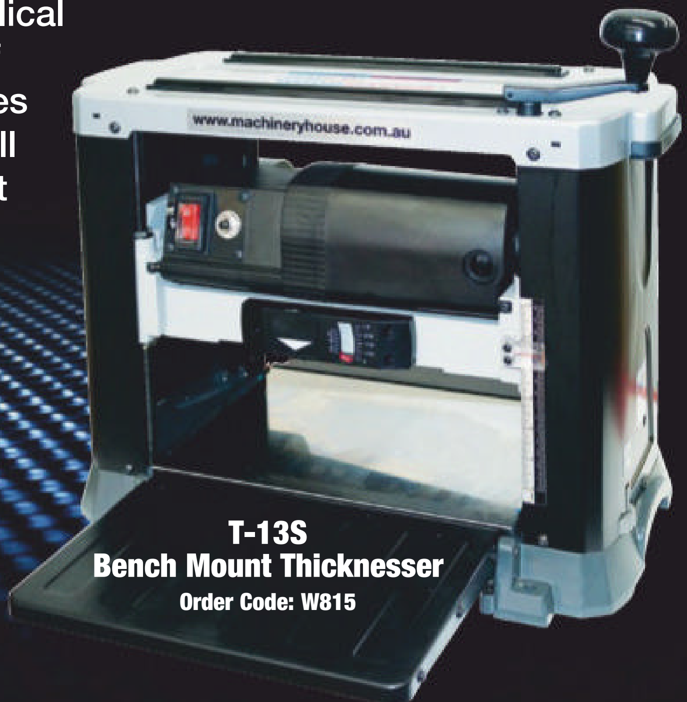
T-13S - BENCH MOUNT THICKNESSER - HELICAL HEAD

This machine differs from the traditional design of thicknessers because of the helical cutter head that's now standard on this T-13S model. The important advantage of a Helical cutter head is its spiral shearing action with the workpiece. This translates into a much smoother cut with less chipping and tear out of the workpiece, as well as significantly much quieter operation compared to the very loud chopping effect produced by a traditional HSS blade cutter-head.



T-13S
Bench Mount Thicknesser
Order Code: W815

PT-254S
Planer & Thicknesser
Combination Spiral Cutter Head
Order Code: W611

T-13B
Bench Mount Thicknesser
HSS Blades
Order Code: W812

PJ-6B
Bench Planer Jointer
Order Code: W618

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